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Supreme Court of the United States

OCTOBER TERM, 1979

No. 79-1621

REYNOLDS METALS COMPANY, *Petitioner,*

v.

ALUMINUM COMPANY OF AMERICA, AND
NATIONAL CAN CORPORATION, *Respondents.*

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SEVENTH CIRCUIT

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PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SEVENTH CIRCUIT

Petitioner Reynolds Metals Company (hereinafter "Reynolds") prays that a writ of certiorari issue to review the judgment and opinion rendered on November 13, 1979, rehearing denied January 17, 1980, by the United States Court of Appeals for the Seventh Circuit[1] in consolidated cases numbers, 78-1909 and 78-1910, reversing the judgment of the United States District Court for the Northern District of Indiana[2] finding petitioner's two patents valid.

OPINIONS AND PETITIONER'S APPENDIX BELOW

The opinion of the Court of Appeals is reported at 609 F.2d 1218 and is reproduced in the Appendix to this petition, pages 1a-5a. The Findings of Fact, Conclusions

[1] Swygert and Bauer, Circuit Judges, and Grady, District Judge, opinion by Judge Bauer.

[2] Allen Sharp, District Judge.

of Law, Opinion and Judgment of the District Court is reported at 457 F. Supp. 482, and is reproduced in the Appendix to this petition, pages 6a-62a. References to petitioner's Appendix below are designated "RMA", a copy of which has been certified to this Court. Emphasis throughout is by petitioner unless stated otherwise.

JURISDICTION

A timely filed petition for rehearing and suggestion that rehearing be in banc was denied by the Court of Appeals on January 17, 1980. This petition for a writ of certiorari was filed within ninety days of that date. The jurisdiction of this Court is invoked under 28 U.S.C. Section 1254(1).

QUESTIONS PRESENTED

There being an urgent need in the public interest to halt the decline of innovation and industrial productivity in the United States and to restore the incentive for innovation provided in Art. I, Sec. 8, Clause 8 of the Constitution and the patent statutes, the questions presented are:

1. Is there a trend of undue judicial hostility to patents on the part of the Circuit Courts of Appeal when they consider the effect of prior art on patent validity, especially as evidenced by the recent trend of overruling favorable patent validity decisions of trial courts on the basis of *de novo* independent redetermination of facts by the Courts of Appeal in violation of Rule 52(a), F.R.C.P.?

2. Is the faith of existing and prospective innovators and investors in the patent rewards for innovation

granted under our Constitution decreased by such *de novo* reviews and is copying of inventions and an excess of expensive patent litigation and appeals thereby encouraged?

3. Did the Seventh Circuit Court of Appeals, in ignoring facts as found by the trial judge in this case and substituting its own independent fact finding without discussion of the trial judge's decision or the evidence and in total disregard for Rule 52(a), F.R.C.P., so far depart from its assigned judicial role as to call for an exercise of this Court's power of supervision?

4. Did the Seventh Circuit Court of Appeals, in holding petitioner's two patents invalid as anticipated under 35 U.S.C. 102 on the basis of prior work which had been found by the trial court to be significantly different from the patent claims, improperly apply 35 U.S.C. 102 in contravention of its own terms, contrary to the actual evidence about that prior work from those working in the industry, and in contravention of the intent, purpose and standard of Article I, Section 8 of the Constitution, which the patent laws are intended to implement?

CONSTITUTIONAL, STATUTORY, AND REGULATORY PROVISIONS INVOLVED

Article I, Section 8 of the Constitution, in here pertinent part provides:

"The Congress shall have Power***

* * *

To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries;—"

Title 35, United States Code, Section 102, in here pertinent part provides:

> "A person shall be entitled to a patent unless—
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States. . .
>
> * * *
>
> (g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed or concealed it."

Title 35, United States Code, Section 103, provides:

> "A patent may not be obtained though the invention is not identically disclosed or described as set forth in Section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

Rule 52(a) of the Federal Rule of Civil Procedure, in here pertinent part provides:

> "Findings of fact shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses."

CONCISE STATEMENT OF THE CASE

Petitioner Reynolds is the owner of two patents relating to aluminum cans and processes for making cans from certain aluminum alloy sheet invented by Linton D. Bylund, a metallurgist working for Reynolds. The conception and development of these inventions is detailed in the trial court's opinion at pages 9a-17a. The patent applications, their prosecution, and the patent claims are detailed in the trial court's opinion at pages 17a-22a.

For several years prior to filing his applications, Bylund had worked on developing an aluminum can that would be competitive in the industry with steel cans. He found that when certain aluminum alloy sheet was made into aluminum cans without the traditional costly intermediate thermal treatments or anneals, great amounts of material and energy were saved.

The Bylund inventions were the first practical extra high strength light weight aluminum cans which were made without any thermal treatments, from the cold rolling operations through the high speed can making operations. The time necessary to make aluminum sheet for cans was reduced by over 40 hours. Costly intermediate anneals were eliminated. The weight of the can was sharply reduced. *An entire industry grew using the Bylund inventions in making billions of these cans per year where none were made before.*

Respondents Alcoa and National abandoned their own efforts to make a competitive new aluminum can and copied the Bylund inventions. Alcoa's sales of aluminum alloy sheet for drawing and ironing into cans using the Bylund inventions then went from zero prior to 1967 to 235,000,000 pounds in 1974. Alcoa saved ap-

proximately one cent for every pound of aluminum processed by using the Bylund inventions. Alcoa heralded the use of the new high strength aluminum sheet as a major achievement, *something that standard textbooks said could not be done.* Alcoa filed and received its own patent which emphasized that the use of high strength aluminum sheet without any intermediate heat treatments was a new and unobvious invention, but Alcoa did not contend that it had made this invention before Bylund. No one at trial testified that the Bylund invention was obvious. In fact, the technical manager for all of Alcoa's aluminum mills candidly testified at trial that the Bylund invention was something that people skilled in the art thought could not be done. See the trial court's findings at 27a to 29a.

Discovery in this case exceeded three years. Hundreds of thousands of documents were examined and the testimony of 51 witnesses was taken. Over 2,500 exhibits were marked by the parties. The trial extended from April 3 to April 20, 1978. On April 25, 1978, the trial court held one full day of oral argument by all parties. By invitation of the trial court, the parties submitted over 400 pages of briefs and over 1,000 proposed findings of fact and conclusions of law.

After careful consideration of all of the above, Judge Sharp rendered a decision on June 6, 1978, consisting of 50 pages containing 37 pages of findings of fact and 63 conclusions of law (pages 6a to 62a). Judge Sharp found, as facts, that Linton Bylund of Reynolds had made outstanding and patentable inventions and that Alcoa (with National) had willfully appropriated these inventions and had infringed the Bylund patents. He found that these inventions were *not* anticipated under 35 U.S.C. 102 nor obvious under 35 U.S.C. 103 and that the patents were enforceable (pages 47a to 53a).

Alcoa and National cited five instances of alleged prior knowledge by others and two publications as rendering the patents in suit invalid. Included therein was the work of Metal Flo and its patent covering same to Massingill and Grigorenko. The trial court found as a fact that insofar as this work related to beverage cans it was incomplete, experimental, and abandoned, (pages 30a, 32a) and that all of this work, whether beverage cans or the large containers called sonobuoys, was the same as the Massingill patent which was an unconventional process involving *heat* and vibrations and had been rejected as not being anticipatory by the Patent Office, (page 33a). The trial court concluded that the Massingill patent does in fact involve annealing, (page 41a). The trial court specifically found that this Metal Flo process was significantly different from the patents in suit (page 58a).

On appeal, the Seventh Circuit Court of Appeals rendered a very short opinion, (pages 1a to 5a), stating that, from its own review of the evidence, it was persuaded that the Bylund patents were the same as the work of Metal Flo (page 3a). The Court of Appeals held that Metal Flo had drawn and ironed certain aluminum containers without thermal treatment (page 4a). These statements by the Court of Appeals are contrary to the unnaminous views about Metal Flo of those actually working in the industry, and directly opposite to the holdings of the Patent Office and the trial court concerning Metal Flo. The trial court found it to be a fact that the Metal Flo process did involve heat and annealing in drawing and ironing, and that the Bylund patent claims exclude any such thermal treatments. On petition for rehearing and rehearing in banc, the decision was adhered to. This timely filed petition followed.

SUMMARY OF PETITION

This petition pleads the cause of innovation and the urgent need for support from this Court to promote the progress of the useful arts as set down in the Constitution. This petition is concerned with the real need to encourage innovative contributions and to recognize them when they occur, as in this case. It is essential to such encouragement and recognition that due regard be given to the expertise of the Patent Office and of trial courts when patents are allowed and sustained on the facts as developed in a trial. Courts of Appeal simply must be confined to their judicial role of appellate review of the decision below, not a *de novo* treatment of the case, if innovation is to survive and flourish.

American industry, if it is to be encouraged to innovate, has to have a patent system where innovative advances are judged impartially and fairly, by defined procedures, so that there is faith in the courts' abilities to properly decide such cases. Unnecessary and costly time consuming litigation now threatens our system of patent incentives because of the failure of Courts of Appeal to limit their judicial role to the well defined appellate review for clear error in the trial courts' findings. Courts of Appeal are simply announcing their own findings of fact, arrived at without the safeguards against error that an in depth trial of the facts provides.

In order for invention incentives to be effective, industry has to have the assurance and expectation that patents will not be struck down on the very art considered and rejected as not being anticipatory by the Patent Office and the trial court, as well as by the industry as a whole, and particularly prior art rejected by those very persons actually working in the art at the time the inventions were made. In the present case, the Court of

Appeals made *de novo* findings directly contrary to all of the testimony of those working in the industry.

There has been an Alarming Decline of Innovation and Industrial Productivity in the United States

There has been an alarming decline in innovation and advances in the useful arts in the United States during at least the past decade. This decline has adversely affected the productivity of United States industry, which damages our economy and, as a further result, will weaken us militarily. This has been noted as extremely serious by industrial leaders, government agencies and the President. Recommendations for remedial action have been forthcoming from all these sources. A central theme to all the recommendations is that innovation and industrial productivity of *United States industry will flourish only if there is an incentive provided that justifies the risks and investments involved.*

The long standing incentive for innovation and investment in innovation in this country is our patent system. The original Constitution itself, with the approval of such farsighted men as Madison and Jefferson, provided for this incentive by the granting of patents to promote the progress of the useful arts, Article I, Section 8, clause 8.

The Power and Responsibility to Promote Innovation Resides Lastly with this Court

The guardian of the Constitutional incentive for innovation as it is implemented by the Statutes is the Supreme Court of the United States. This Court has held that there is a *standard of patentability* expressed in

the Constitution, as explained by this Court in *Graham* v. *John Deere Co.*, 383 U.S. 1, 6 (1966) as follows:

> ". . .Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system which by constitutional command must 'promote the Progress of . . .useful Arts.' This is the *standard* expressed in the Constitution and it may not be ignored."

While the Constitutional standard has most often been mentioned in recent years when our Courts of Appeals have struck down patents, that Constitutional standard should apply with *equal* force to *uphold* the validity of worthwhile patents on *advances which have significantly improved industrial machines and processes,* see *United States* v. *Adams,* 383 U.S. 39 (1966).

The Bylund Patents Embody Substantial Innovation which was Copied by Respondents and Adopted by the Whole Industry

The truly impressive advances which the inventions of the present patents in suit brought to the industry appear in detail in the trial court's opinion in seventeen numbered paragraphs as well as in more general terms, (see pages 27a to 29a). These advances are of the kind saving energy and materials, which are *of critical importance to our country today.*

Specifically, the inventions eliminate the need for great quantities of heat energy previously used, save substantial time in carrying out the process, and reduce the amount of aluminum necessary to make a satisfactory can. Furthermore, these aluminum cans are now being recycled. *Conservation of all of these things is vital to this nation, now threatened with material and energy shortages.*

This case involves an innovation which has not only been successful and of wide commercial significance, but one which has supplanted all other competing processes in the manufacture of aluminum beverage cans. Competition has been enhanced by making aluminum cans cost competitive with steel cans, and by offering non-exclusive licenses at a low royalty rate to the entire industry.[3] The decision of the trial court painstakingly analyzes the evidence and shows that all of the statutory requirements for patentability—utility, novelty and unobviousness have been met. Further, the trial court's decision and the evidence on which it is based show that the Constitutional "standard" of invention has been met, in that the progress of the useful arts of making beverage cans has been materially advanced.

The Court of Appeals Failed to Follow Its Appellate Review Function

We submit that this case was incorrectly decided by the Court of Appeals through its disregard of Rule 52(a), Federal Rules of Civil Procedure, and through its misapplication of Section 102 of the patent statutes. More importantly, we earnestly believe that the decision of the Court of Appeals is a disavowal and contradiction of Article I, Section 8, Clause 8 of the Constitution, and of the patent statutes implementing that Constitutional provision, in that it discourages the progress of the useful arts.

The framers of the Constitution thought it important to include a provision for patents in the Constitution. Their reasoning appears in the Constitutional provision itself—they intended patents to be an incentive

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[3] Alcan Aluminum Corporation sought, after the trial court's decision, and was granted a license by Reynolds.

"to *promote* the progress of . . .useful arts." The wisdom of that provision has served our country well over much of its history but the Constitutional purpose has become endangered in recent years.

The Courts of Appeal have become increasingly unwilling to recognize patents as valid, to an alarming degree. This predisposition to hold patents invalid has even caused the Courts of Appeal to disregard our judicial system's distinction between trial and appellate courts, and to engage in de novo redetermination of the facts themselves, in order to find patents invalid.

We submit that this trend on the part of the Courts of Appeal has weakened the faith of innovators, potential innovators and investors in the patent rewards for innovation, and that it has already caused an alarming decline in innovation in this country in recent years.

Moreover, we submit that this trend encourages those who wish to manufacture something, to copy rather than to try to innovate. There is no risk of failure involved in simply copying the proven advances made by others and no investment of time and research is necessary. If called to account for the copying, expensive patent litigation has been an all too easy way out. Especially in view of the trend in the Courts of Appeal to retry patent cases by redetermining the facts, appeals by infringers are encouraged regardless of their merit. This adds to the burden of cases that must be dealt with by the courts.

Only the intervention of this Court and the application of its powers of supervision can insure that the Courts of Appeal do apply the proper standards, and that patents are restored to their Constitutional role of *promoting* progress in science and the useful arts.

ARGUMENT

There is an Alarming Decline of Innovation in the United States

Today, it is well known and a subject of much comment and great concern that innovation in the United States *is on the decline and has been, during at least the last decade.* This decline has adversely affected U.S. industry and productivity, and has been noted as extremely serious by industrial leaders, governmental agencies, the Congress, and by the President.

For example, a recent newspaper editorial under the heading "Invention in America" noted:

> "Although America's technological leadership has diminished in the past decade, the effect of the slippage has been subtle—a competitive advantage to a Japanese industry here, a German firm there.
>
> U.S. primacy has continued, yet the share of U.S. patents granted to foreign residents *more than doubled* in a recent 15-year period. And the U.S. patent balance *declined* almost 47 percent between 1966 and 1975, while *Japanese patenting,* since 1970, *increased more than 100 percent* in every major industrial category. The situation seems to be worsening.
>
> * * *
>
> American innovation will flourish in a climate *where daring is rewarded,* where competition is intense, where risk does not discourage investment in the future—." (Washington Star, Wednesday November 7, 1979).

As another example, a recent article entitled "The Breakdown of U.S. Innovation" noted:

". . .*Innovation creates jobs, boosts productivity,* and contributes to export and a strong, healthy

balance of trade. Above all, *innovation* generates economic momentum and *helps guarantee American preeminence* in a world where power and progress are often measured in terms of technological achievement.

* * *

Yet from boardroom to research lab, *there is a growing sense that something has happened to American innovation.* Some say it is in rapid decline.

* * *

Morse[4] goes on to warn that new high technology growth companies are no longer being formed 'in sufficient numbers to provide the jobs and technical products for export which will be needed in the decades ahead.' That would mean less economic growth, fewer jobs, a loss of foreign markets, greater import competition in domestic markets, and finally, of course, a potentially devastating rise in trade deficits." (Business Week, February 16, 1976 at page 56).

Senator Lloyd M. Bentsen, Chairman of the Joint Economic Committee, recently stated on the subject of the decline of productivity in the United States:

> "You see, what's happening here in this country is that we're no longer competitive with the Japanese and the Germans on many of our products. Let me give you an example. Of the 22 major modern blast furnaces in the world, 14 of them are in Japan. None is in the United States. *We just have to put more modern tools in the hands of our working people, or we can't compete."* (NBC's Meet the Press, March 2, 1980).

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[4] Richard S. Morse, Senior Lecturer at the Massachusetts Institute of Technology.

J. Peter Grace, Chairman of W.R. Grace & Company, a $5 billion a year conglomerate which was founded by his grandfather states:

> "I'm not optimistic about the U.S. however, until we solve our problems.
>
> The whole damn American steel business is noncompetitive with many foreign producers. So are some other industries. *They don't have the incentive to modernize.*
>
> * * *
>
> Great countries are built by people who take chances and have the incentive to invest in something unusual." (Time Magazine, February 4, 1980 at page 72).

The Chairman of E.I. duPont Nemours and Company recently stated:

> ". . .To put it simply, the economic health of an industrialized nation such as ours is bound to the innovation process.
>
> * * *
>
> . . .in the U.S., more than in the Nations with which we compete technologically, judicial attitudes and legal procedures cast a cloud over patents. *People know that litigation is an all-too-easy way out, if only they are willing to endure the costs.*
>
> * * *
>
> . . .The point I want to make is that the judicial system reflects an overall climate within our society that is in many ways hostile to innovation and technical creativity." (Patent and Trademark Institute of Canada, Vol 5, August 1979).

Culminating a study of several years by the various departments of the government, the President reported

on October 31, 1979 on the subject of "Industrial Innovation Initiatives"'

> "Other industrial countries, recognizing the importance of innovation, are extending their competitive advantage through industrial policies, programs. To respond to this challenge to our economy and the competitive position of U.S. industry, the review developed policy options *intended to foster the Nation's entrepreneurial spirit* for the decades ahead." 452 P.T.C.J. at F-1 (1979).

As recently stated by Karyl Luck, Dean of The Graduate School, Patent Resources Institute, Washington, D.C.:

> ". . .the patent system was essential for the long historical and almost exponential growth in invention and innovation, in the United States. Presidents Washington, Adams and Jefferson, who were instrumental in the founding of the U.S. patent system and its practical implementation from the outset, were not dedicated to the progress of science and the useful arts as an abstract, philosophical end in itself. Rather, *the ultimate result they sought was the increased productivity and mercantile development that society derives as a consequence of invention and innovation.* The patent system, constitutional in foundation and statutorily enacted in 1790, has provided a major incentive for individual inventors and large and small corporation alike, as well as their investors, to commit the time, money insights and energy needed to create new means for improving man's material condition." Graduate School Bulletin (1980).

It is reasonable to fear that a hurried and unstudied decision destroying the patent reward for this inventor Bylund and his company Reynolds, after the patents had been upheld by the trial judge, following many days of trial, *will tend in the years ahead to discourage rather*

than promote progress of the useful arts as intended by Article I, Section 8, Clause 8 of our Constitution.

United States industry needs very badly to have the kind of support for inventions which improves production machinery. Such support was provided by the careful analysis of the facts and the opinion of the trial judge in the instant case.

The Innovation and the Advance in the Art Made by the Bylund Inventions Was Overwhelming

In the last decade, when the decline in innovation and productivity in the United States commenced to become apparent, production in accordance with inventions of the patents in suit was a notable step in the more traditional American direction. No one has denied that these inventions were of great importance to the can making industry.

In addition to changing the conventional method of aluminum beverage can making *by the elimination of all heat of annealing and stress relieving while rolling the sheet, and drawing and ironing the can* (page 26a), the inventions resulted in the following events and industrial advances over the prior art, *as specifically found by the trial court* (pages 28a-29a):

1. aluminum D&I [draw and iron] cans were made competitive with TFS [tin free steel] in the industry;
2. The draw and iron method swept the industry free of all other methods;
3. H19 temper D&I [draw and iron] sheet swept the industry free of all other tempers;
4. The draw and iron aluminum can rose from nothing in the industry to capture over 50 percent of the market by 1976;

5. Alcoa sales of H19 [extra hard temper] D&I [draw and iron] stock rose from the 10,000 pounds ordered by Reynolds, which was the whole of Alcoa's 1967 sales, to 8 million pounds in 1970, to 235 million pounds in 1974;

6. Alcoa's sales of "O" [soft] temper D&I [draw and iron] stock fell from 21 million pounds to less than a million pounds over the period of 1970 to 1974;

7. National's business in aluminum cans went from zero in 1967 to being the leading manufacturer by 1974;

8. costly intermediate anneals were eliminated;

9. only Bylund solved the problem of the struggle with TFS [tin free steel] in the industry;

10. only Bylund was able to satisfy the need in the industry for an aluminum can to compete with TFS [tin free steel];

11. all of the industry failed to beat TFS [tin free steel] with the impact method or with high strength alloys in "O" [soft] temper;

12. the weight of the aluminum can was drastically reduced;

13. costly intermediate handling of coils and storage was eliminated;

14. unexpectedly, tool life was found to be better with H19 [extra hard] temper than with "O" [soft] temper sheet;

15. Alcoa heralded use of H19 [extra hard] D&I [draw and iron] stock as a major achievement;

16. Alcoa filed and received a patent which emphasized that the use of H19 [extra hard] temper in drawing and ironing without any anneals or heat treatments was an unobvious invention;[5]

17. National [defendant, National Can Co.] lauded its can in its advertising as the "dynamic new can".

The Bylund inventions were truly a substantial and innovative contribution to the useful arts.

Alcoa Copied the Bylund Inventions As Soon As It Heard of Them And Publicly Claimed Credit For Them

Before the Bylund inventions of the patents in suit, the entire industry used aluminum sheet in heat softened tempers in making the drawn and ironed cans (23a). This sheet had received the customary heat treatments to soften it. The Alcoa specifications for sheet to be used for drawn and ironed cans called for the "O" or heat softened temper (24a), which Alcoa regularly manufactured (33a).

As to the Metal Flo process, Alcoa had known about it for years (33a). Alcoa had concluded that the heat in the Metal Flo process was one of its significant features (RMA 555).

But immediately after Reynolds placed an order with Alcoa in July of 1967 for 10,000 lbs. of H19 (extra hard) sheet, revealing that it was for use in drawing and ironing cans, Alcoa *at once* decided to discontinue use of the "O" (heat softened) sheet in making its cans, and to copy Reynolds in the use of the H19 (extra hard) temper metal in drawing and ironing the cans. Mr. Close, the *Chairman of Alcoa,* 5complimented the

[5] The trial court noted in its opinion (31a) that counsel for Alcoa disavowed any claim whatsoever at trial that someone at Alcoa invented the claimed subject matter prior to Bylund.

Alcoa technician who performed the copy work with the words "Congratulations, I didn't think you could get there with the Drawn Iron process" (25a). Mr. Close immediately *shut down Alcoa's operations* using the impact method of making aluminum cans, on which it had spent millions of dollars, and urged its customers to change to the extra hard sheet and the draw and iron method without heat. Alcoa regarded the Bylund inventions as a "major move" in the market, one which would enable aluminum cans to "leap-frog" into a preferred position (25a). All of the above was found as fact by the trial court (25a), *and it is not challenged.* This is understandable, for Alcoa's own full page advertisement in *Package Engineering* for October, 1968 heralded the Bylund inventions, but while claiming credit to Alcoa, in the following language (RMA 1):

> "In new developmental and experimental work, *Alcoa research* and development groups are performing operations with H19 temper rigid container sheet that standard metalworking *text and handbooks say cannot be done.* H19 rigid container sheet is blanked and drawn *without intermediate anneals* to form seamless can bodies."

This paragraph, authored by Alcoa, which knew the prior art, including the Metal Flo process, is but one of the Alcoa *admissions that Bylund made great inventions that experts said could not be done, and that Alcoa adopted and was claiming as its own development.*

This accomplishment of the inventions was also admitted by Alcoa's own expert Nielsen at the trial. As to his testimony the trial court found (29a):

> "Mr. Nielsen candidly admitted at trial that the Bylund invention was something that people skilled in the art thought could not be done and that such people would have been impressed."

There Is Public Perception of A Trend of Excessive Hostility to Patents In The Circuit Courts of Appeal Which Will Be Intensified By The Present Decision

Clearly, patents mean nothing by way of an incentive to innovation, unless they are enforceable in the courts. However, there is a *perception* by the public that there is a growing trend of hostility to patents in the Courts of Appeal. Consider, for example, that for the five years 1925-1929, of all the patents ruled on by the Courts of Appeal that only 33.4% were held invalid.[6] In contrast, the Patent Office reports that for the five years 1968-1972, 69% of the utility patents ruled on by the Courts of Appeal were held to be invalid.[7] And the situation is not improving. For the five years 1973-1977, the invalidity holdings increased to 72%.

During the 1968-1972 period the *trial courts* only held 35% of the utility patents they ruled on invalid. For the five years 1973-1977, the figure for the trial courts was 48% invalid. Some commentators have suggested that on a statistical basis, it would be expected that 50% of litigated patents would be held valid and 50% invalid since such figures would generally accord with disputable matters of all kinds brought to court.[8] The figures do at least tend to show that the trial courts are more in accord with even handed treatment of patent validity than the Courts of Appeal. There is, in any event, a public *perception* of hostility on the part of the

[6] Federico, "Adjudicated Patents 1948-1954", 38 JPOS 233 (April 1956), which also reported on adjudication from 1925-1954.

[7] BNA Patent, Trademark & Copyright Journal, No. 455, Nov. 22, 1979, page D-1.

[8] Honorable Howard T. Markey, "The Status of the U.S. Patent—System Sans Myth, San Fiction," 59 JPOS 164 (March, 1977).

Courts of Appeal, witness the comments by DuPont's chairman, supra at page 15.

We submit that decisions like that in the present case are responsible for this perception of hostility. In the instant case the Court of Appeals simply substituted its erroneous views of the facts, unaided by the testimony before the trial judge, and unaided by the expertise of the Patent Office or the expertise acquired by the trial judge during a long trial. The statements by the Court of Appeals about Metal Flo are contrary to the views of the very people working in this art, who had known of Metal Flo, and are contrary to the views of the Patent Office about the nature of the Metal Flo process. We submit that this kind of treatment tends to discourage innovation and goes contra to the purpose of Art. I, Sec. 8, clause 8 of our Constitution.

The Failure of the Court of Appeals to Even Mention the Massingill-Grigorenko Patent 3,509,754 Suggests Some Serious Misunderstanding of The Real Issues of This case

Out of the many defenses presented by respondents, the Court of Appeals picked out just one, the "work of the Metal Flo Corporation" and declared petitioners' Bylund patents to be "anticipated" by this work, i.e., the same as the Bylund inventions. However, the Court of Appeals decision does not even consider the many and detailed findings of the trial court, *including those very findings which dealt with the best evidence of the Metal Flo work,* the Massingill-Grigorenko Patent 3,509,754 of May 5, 1970 (RMA 484-506).

First, the patentee Grigorenko testified that the

Metal Flo process and that of the Massingill-Grigorenko patent were one and the same (RMA 1153-1154):

"Q. Okay. The Metal Flo process is disclosed in your United States patent. Is that correct? As you know it?

A. That is correct."

Second, the trial court found that the Massingill patent discloses even *more* than the Metal Flo work and that it was *not* an anticipation or the same as Bylund's invention (50a).

Among the further findings of the trial court which dealt with the Metal Flo work, as described in great detail in its Massingill-Grigorenko patent was the following (32a):

> "This work was also incomplete, *experimental* and *abandoned.* [Gardner Dep. Tr. 123-124]. The cans were not successful and were never filled and tested. Mr. Gardner testified that the Metal Flo process for beer cans was 'not mechanically or technically sound, that approach, and the thing just kind of *died a writhing, agonizing death'* [Gardner Dep. Tr. 125]. Further, the Metal Flo process is in the Massingill patent and was considered and rejected by the Patent Office [Grigorenko Dep. Tr. 78, 85].

The Massingill-Grigorenko patent which is assigned on its face to Metal Flo Corp. is not even referred to in the Court of Appeals' decision, even though it was part of the trial court's consideration and was deemed to be the best description of the Metal Flo work by the testimony of those familiar with the subject. The trial court did consider and make further findings including

consideration of the Massingill-Grigorenko patent as follows (33a):

> "Massingill is an unconventional drawing operation involving telescopic punches, *heat,* vibrations, uninterrupted continuous movement of metal, and was rejected by the Patent Office. *Everyone rejected it for cans.* Alcoa had a copy of the application in 1964. It certainly did not teach Alcoa to stop annealing the coils[9] it was supplying to Coors in 1966 and 1967."

The Court of Appeals overlooked the careful consideration and findings of the trial court and the important explanation in the Massingill-Grigorenko patent. Respondents did not present any witness at the trial to testify about the Metal Flo work. Additionally, Mr. Bylund, who the trial court found highly credible, testified that his inventions were significantly different than Metal Flo (RMA 834-846).

The Massingill-Grigorenko patent was of interest to all concerned in its relation to the Metal Flo process. *Alcoa was also interested* in the patent and the Metal Flo work at an early date and rejected it for cans. The trial court noted that it involved heat-annealing in its finding (41a):

> "A marked up copy of the Massingill patent was found in Mr. McBride's *files of Alcoa* (2392). On this document (page 2) there appears the notation "O' temper tensile and yield strength greater than H19 value' [McBride Dep. Tr. 687], contrasting Example 4 involving 'O' temper and Example 6 involving 'H19' temper of Massingill. Thus, it is quite reasonable to conclude that *Massingill does in fact involve some annealing* when the 'O' temper properties exceed those of 'H19'.' "

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[9] Meaning the coils of cold rolled sheet from which the cans were formed.

The trial court further noted that the Patent Office had considered the Massingill-Grigorenko patent with relation to the Metal Flo process, as follows (42a):

> "—The Patent Office did consider the Massingill patent which is the Metal Flo process. Under such circumstances, the presumption of validity over Massingill and the Metal Flo process is enhanced,—".

The Court of Appeals failed to recognize this presumption of validity over the Metal Flo process and the Massingill-Grigorenko patent.

The trial court found that the Metal Flo process had *never been fully understood* and was incomplete and abandoned to the extent it related to beverage cans (48a):

> "The Metal Flo process and cans made thereby are *not an anticipation* of the Bylund patents here in suit because that process has never been fully understood, was only an incomplete experiment that was later abandoned to the extent that it related to beverage can manufacture."

The trial court also mentioned that the Massingill-Grigorenko patent had been considered by the Patent Office when it was determined that the petitioner's Bylund patents were not anticipated, finding that (50a):

> "The Massingill patent discloses *even more than* the Metal Flo experimental beverage can program, *which was abandoned,* and the latter program would have had no impact whatsoever on the issuance of the Bylund patents, since the Massingill patent was considered by the Patent Office which determined the Bylund patents *were neither anticipated nor rendered obvious* thereby."

annealing in their drawing and ironing and that the claims here at issue in the Bylund patents *exclude the intervention of such thermal treatments.* Thus, the statement by the Court of Appeals that Metal Flo sold sonobuoys which it had made by drawing and ironing "without annealing or thermal treatment" is totally contrary to the fact, contrary to what was found by the trial court, contrary to what was found by the Patent Office and contrary to what was published and what was believed by the industry.

The Beverage Can Program of Metal Flo Was Experimental and Was Abandoned as a Disaster

The Massingill-Grigorenko patent on the Metal Flo process itself speaks to the possibility of using the Metal Flo process to make beverage cans, and, in time, Metal Flo did do some experimental work as to making beverage cans by the Metal Flo process.

As to the trial court characterizing Metal Flo's work concerning beverage cans as "incomplete, experimental and abandoned", no characterization was ever more accurate. The experimental beverage can program of Metal Flo was a joint venture with and funded by Jones & Laughlin Steel (J&L). Mr. Gardner of J&L testified that Metal Flo's activities as to beer cans were an "abandoned experiment" (RMA 1115-1118). As for the experimental beer can R&D program with J&L, both Grigorenko of Metal Flo and Gardner agreed that all reports were marked "Confidential" and that they were "not something for the public" (RMA 1155, RMA 1106-1107). Some of the cans were filled with *water* by J&L, but Metal Flo did not fill and test any cans (RMA 1156-57).

The last program on experimental cans that Metal Flo did with J&L was called a failure, "the whole can collapsed like an accordion" (RMA 1158). No one ever became interested in using the Metal Flo process to make commercial aluminum can bodies (RMA 1124). Mr. Gardner testified that the Metal Flo method of making multiple beverage cans, which is disclosed in the Massingill and Grigorenko patent, was "not mechanically or technically sound, that approach, and the thing just kind of died a writhing, agonizing death" (RMA 1120). Mr. Gardner further testified it wasn't just that it couldn't compete, "No, it was a prototype machine which was wrong from the start" (RMA 1120). Mr. Gardner further testified that Metal Flo had tried to interest Continental Can and National Can in a can machine (RMA 1102) to no avail. He specifically testified that J&L "abandoned" the project in order not to commit "commercial suicide" (RMA 1118-1119).

Metal Flo tried to interest various other companies in using its process for making beverage cans, but they, like J&L, rejected it. Alcoa concluded that the Metal Flo process for beverage cans *"doesn't have a chance"* (RMA 560). Reynolds had a "complete lack of interest in Metal Flo" (RMA 1362-1363), after the Metal Flo visit to Reynolds referred to in the Court of Appeals opinion (4a).

The Metal Flo process for beverage cans was experimental, never successful and long dead and abandoned until it was resurrected by respondents for purposes of this lawsuit. As stated in *Reynolds* v. *Whitin Mach. Works,* 167 F.2d 78, 84 (4th Cir. 1948):

> ". . .Patents for useful inventions ought not be invalidated and held for naught because of such excursions into the boneyard of failures and abandoned experiments."

Here, the trial court found specifically that the Metal Flo process was not an anticipation or the same as Bylund's inventions because it was only "an incomplete experiment that was later abandoned to the extent that it related to beverage can manufacture" (42a, 48a), citing *inter alia Coffin* v. *Ogden,* 85 U.S. 120 (1874); *United States* v. *Adams,* 383 U.S. 39 (1966); and *Lyon* v. *Bausch & Lomb Optical Co.,* 224 F.2d at 534) (ed Cir. 1955). Metal Flo does clearly fall into the same category of prior abandoned efforts that was involved in *Lyon* v. *Bausch & Lomb, supra.* As Judge Learned Hand observed in that case (224 F.2d at 534):

> "He did indeed test it out to his satisfaction; and when he had done so, he concluded it would not do what he was after. It did not produce a more 'rugged' film and he gave it up. It was in effect an abandonment; it did more than fail to advance the art; it put the process among those efforts that are proved useless. All the reasons that have made *the courts refuse to treat experimental users as anticipations,* apply even more convincingly; it is not alone that such activities are not evidence of anticipation, they are evidence against."

Not only does the case law preclude holding abandoned experiments to be anticipations, the statute itself excludes such abandoned activities from consideration. Section 102(g) of 35 U.S.C. expressly provides:

> "A person shall be entitled to a patent unless. . .
>
> * * *
>
> (g). . .before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed or concealed it."

Abandoned, unsuccessful experiments add nothing to the fund of human knowledge and advance the useful arts not one whit. By statute and case law they cannot, and by common sense they should not, be held up as anticipations of complete, successful and enduring advances in the useful arts.

The Decision of the Court of Appeals is Anomalous in Stating that Metal Flo was an Anticipation when the Trial Court, the Patent Office, and Those in the Industry Disagreed

In stating, as it did, that Metal Flo did not involve heat or annealing during drawing and ironing, the Court of Appeals found a fact not only *contrary* to what the trial court found, but also *contrary* to what the Patent Office found and *contrary* to what was testified to at trial. Moreover, the Court of Appeals' statement is *contrary* to what is shown in documents and depositions of the technical personnel of the parties here and others investigating Metal Flo, *contrary* to what the Metal Flo Massingill-Grigorenko patent itself says, and *contrary* to what one of the inventors of the Metal Flo process testified.

Published trade literature disclosed that the Metal Flo process involved heat on the order of 500°F and was actually a warm drawing operation (RMA 481-482). The Massingill-Grigorenko patent itself disclosed the generation and retention of heat (RMA 492-493). The patent expressly provided that heat was necessary to the performance of the Metal Flo machinery (RMA 496), and Mr. Grigorenko, one of the inventors of the Metal Flo process, so testified (RMA 1143).

Alcoa's Chief Engineer, Mr. Rieke, studied the Metal Flo process and the Metal Flo patent in 1964 and concluded (RMA 555):

> "The heat generated as the material is formed undoubtedly has a definite bearing on the ability of

this method to proceed through the series of reduction."

Mr. Gardner, of Jones and Laughlin Steel, testified about the heat in the Metal Flo process and that there was a "vast difference" between it and conventional drawing (RMA 1104). Mr. Held of Jones and Laughlin Steel wrote (RMA 1109):

> ". . .the cans are drawn warm rather than cold, as in conventional drawing. The exact temperature difference is unknown, although it certainly exists."

Dr. Brick, a scientist at Continental Can, also wrote that the Metal Flo process involved heat (RMA 1127).

Mr. Bylund, whom the trial court found to be "highly credible", testified at trial that it appeared to him from the disclosures of the Massingill-Grigorenko Metal Flo patent that heat was causing a stress relieving effect in the metal of Example 6 (sonobuoy from 3003 H19) at the high cold work level, so that there was no work hardening taking place (RMA 835).

The Court Of Appeals Improperly Engaged In A De Novo Redetermination Of Facts

That the Court of Appeals did engage in a de novo redetermination of facts in this case is clear from their decision itself. The decision states at the outset that, "From *our* review of the evidence, *we are persuaded* that everything by the Bylund patents were fully disclosed in the prior art, particularly the work of the Metal Flo Corporation" (3a).

The Court of Appeals' decision totally ignored the trial court's findings and did so without referring to them at all. In its treatment of the sole defense it dealt with, the Court of Appeals simply stated that a company called Metal Flo had sold containers which it had made "*without* annealing or thermal treatment", at a time earlier than petitioner's invention (page 4a), and suggested that the trial court had "disregarded the evidence of Metal Flo's work," (4a).

Simply reading the trail court's opinion shows that there was not any "disregard" of Metal Flo's work. To the contrary, the decision is replete with consideration of and findings regarding Metal Flo's work, the nature of the Metal Flo process, and the teachings of the Massingill-Grigorenko patent which covered the Metal Flo process. The Court of Appeals simply "disregarded" those findings and substituted its own erroneous independently derived views, which views are directly contrary to the whole industry.

Rule 52(a) Of The Federal Rules Of Civil Procedure Recognizes An Important Distinction Between Trial And Appellate Courts Which The Seventh Circuit Has Ignored

The distinction between trial and appellate courts in our judicial system is basic. Courts of Appeal simply do not have the time or the opportunities to evaluate evidence and develop an expertise in the same manner as trial courts who hear the testimony in a trial of several weeks. That distinction is recognized and implemented in Rule 52 of the Federal Rules of Civil Procedure as to the respect to be accorded findings made by the trier of fact. The distinctions have also been clearly enunciated by this Court, see *Zenith Radio Corp.* v. *Hazeltine Research, Inc.*, 395 U.S. 100, 123 (1969), wherein this Court stated:

> "In applying the clearly erroneous standards to the findings of the district court sitting without a jury,

> appellate courts must constantly have in mind that their function is not to decide factual issues *de novo*. The authority of an appellate court, when reviewing the findings of a judge as well as those of a jury, is circumscribed by the deference it must give to decisions of the trier of the fact, who is usually in a superior position to appraise and weigh the evidence."

See also *United States* v. *Yellow Cab Co.*, 338 U.S. 338 (1949).

In the present case, trial of this action before Judge Sharp took 15 full trial days. During trial, the live testimony of ten witnesses was taken. Not only was the inventor Bylund deposed by respondents for over thirty days prior to trial, he was cross-examined for almost three full days at trial. Over 1800 exhibits were received into evidence. After the trial ended, Judge Sharp held one full day of oral argument by all parties. By invitation of the court, the parties submitted more than 400 pages of briefs and more than 1000 proposed findings of fact. Judge Sharp's decision, we submit, painstakingly analyzes the evidence and shows the reason for his findings and conclusions.

The Court of Appeals did not review the lower court decision, but has rather proceeded *de novo* on its own as if there had not been a trial or Patent Office proceedings, both of which considered and rejected Metal Flo. And the Court of Appeals *de novo* approach, conducted without benefit of the insight and knowledge provided by a trial, has resulted in a decision filled with factual inaccuracies which arrives at a conclusion that can only be described as divorced from reality. We submit that the purpose of Rule 52(a) is precisely to prevent such a *de novo*, inadequate "new trial" as to the facts.

Disregard By Appellate Courts of Rule 52(a) Encourages Litigation And Expensive Appeals

Professor Charles Alan Wright[10] discussed the effect of the erosion of Rule 52(a) by appellate courts quoting with approval the statement in *Pendergrass* v. *New York Life Ins. Co.*, 181 F.2d 138 (8th Cir. 1950):

> "The entire responsibility for deciding doubtful fact questions in a nonjury case should be, and we think it is, that of the district court. The existence of any doubt as to whether the trial court or this Court is the ultimate trier of fact issues in nonjury cases is, we think, detrimental to the orderly administration of justice, impairs the confidence of litigants and the public in the decisions of the district courts, and multiplies the number of appeals in such cases."

At least some appellate judges today also view with alarm the increasing tendency of appellate courts to find the facts for themselves. Judge Aldisert, in *Trio Process Corp.* v. *L. Goldstein's Sons, Inc.*, _____ F.2d _____, 204 U.S.P.Q. 881, 888, 889 (3rd Cir. 1980), in a dissenting opinion, stated:

> ". . .instead of sniping at the facts by contriving artificial legal precepts, we have invaded the district courtroom and set ourselves up as a rump fact-finding authority. Because there is neither reason nor empowerment for this action, I dissent.
>
> My colleagues in the majority, I regret to say, have now tossed the Anglo-American tradition of appellate review to the four winds. They claim a new prerogative as an appellate court that goes beyond even Professor Wright's concerns in 1957; they have simply found the facts that are to their liking.
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[10] The Doubtful Omniscience of Appellate Courts, 41 Minnesota Law Review 751 (1957).

> To the extent an appellate court strays from its traditional role of reviewing the choice, interpretation, and application of legal precepts, and unnecessarily intrudes upon the rights and privileges of the trial courts, there is a corresponding impairment in the confidence of litigants and the public in the decisions of the trial courts, and a broadcast of an unwarranted belief that appellate courts are better qualified than trial judges to decide what justice requires. I believe the court's decision today does precisely that."

We also view with alarm the tendency of appellate courts to find facts for themselves. We sugest it frequently leads to incorrect, anomalous results, as here, and is responsible for the public perception of hostility to patents by the Courts of Appeal. Moreover, it encourages appeals by a losing party seeking to gain in the Court of Appeals a *de novo* redetermination of the facts.

The Seventh Circuit's Application Of 35 U.S.C. 102 Is In Conflict With The Intent Of The Statute And In Conflict With The Other Circuits

The *sole* stated ground for the Court of Appeals' reversal of Judge Sharp's decision was the statement by the Court that Metal Flo was an "anticipation" of or the same as the Bylund patent claims under 35 U.S.C. 102. In so doing, the Court of Appeals improperly applied Section 102. The Court of Appeals clearly overlooked the trial court's finding that Metal Flo involved heat and annealing during drawing and ironing and that the Bylund patent claims are substantially different in that there are no such thermal treatments. Such differences go to the very substance of the inventions of the patent claims and, in a proper decision, would immediately preclude application of Section 102 of the Patent Statutes.

Section 102 deals with situations where there are *no* differences between the prior art and the patent claims, where there is identity. Section 103 deals by its own terms with the situation where there are differences. Thus the introductory portion of Section 103 provides "A patent may not be obtained though the invention is not *identically disclosed or described* as set forth in Section 102 of this title. . ." The language used by the Court of Appeals about differences[11] that would suggest themselves to one of ordinary skill in the art, states criteria appropriate to evaluations of nonobviousness of Section 103, not anticipation under 102. There is a material difference between 35 U.S.C. 102 and 103 as to the issues arising under the two sections and the relevant evidence appropriate to the two sections. *In re Hughes,* 345 F.2d 184 (C.C.P.A. 1965). The tests and inquiries to be made under Section 103 have been set out in detail, *Graham* v. *John Deere Co.,* 383 U.S. 1 (1966), with the thought that (383 U.S. at 18):

> "We believe that strict observance of the requirements laid down here will result in that uniformity and definiteness which Congress called for in the 1952 Act."

Here, the Seventh Circuit did not observe the requirements laid down in *Graham.* Despite the trial court's painstaking and detailed adherence to the *Graham* guidance and criteria, the Court of Appeals does not even mention Section 103 or the *Graham* case. Indeed, the Seventh Circuit totally ignores all the evidence presented below and trial court's findings thereon relative to nonobviousness under Section 103.

[11] Concentration by the Court of Appeals on dimensional differences between the patent claims and Metal Flo illustrate the Court's *de novo* approach. Those dimensional differences are not relied on or even mentioned in the trial court's opinion.

This decision of the Seventh Circuit, applying as it does Section 102 despite differences between the prior art and the patent claims, is in conflict with the rule in and decisions of the other circuits. In the Ninth Circuit, for example, anticipation under Section 102 is correctly recognized as a technical defense that is not satisfied unless all of the same elements are found in a single prior art reference in exacty the same situation and united in the same way to perform an identical function. *Jones* v. *Vefo, Inc.*, _____ F.2d _____, 204 U.S.P.Q. 535 (9th Cir. 1979). This rule is consistently applied in the Ninth Circuit, see *Schroeder* v. *Owens-Corning Fiberglas Corp.*, 514 F.2d 901, 904 (9th Cir. 1975), wherein the court stated:

> "We cannot harmonize the court's finding, that the relevant prior art references were not identical to the composite of the '459 patent, with its conclusion of law rendering the latter invalid as anticipated. Anticipation is a technical defense which must meet strict standards."

Other circuits (save the Seventh) also apply the same rule. The rule in the Fourth Circuit, see *Canron, Inc.* v. *Plasser American Corp.*, _____ F.2d _____, 203 U.S.P.Q. 641 (4th Cir. 1979) is as follows:

> "We recognize that there is no anticipation unless all of the same elements are found in the same situation and united in the same way to perform an identical function."

See also, *Tights, Inc.* v. *Acme-McCrary Corp.*, 541 F.2d 1047, 1055-1056 (4th Cir. 1976); *Ling-Temco-Vought, Inc.* v. *Kollsman Instrument Corp.*, 372 F.2d 263, (2d Cir. 1967); *Shanklin Corp.* v. *Springfield Photo Mount Co.*, 521 F.2d 609, 619 (1st Cir. 1975) *Paeco, Inc.* v. *Applied Moldings, Inc.* 562 F.2d 870 (3rd Cir. 1977).

Anomalous Patent Validity Decisions, With Their Divorcement from Reality, Destroy The Faith Of Innovators, Potential Innovators And Investors

If patents are not enforceable in the courts, they are worthless as any kind of incentive to innovation. If Courts of Appeal do not or will not properly decide patent cases under the Constitution, the patent statutes and judicial precedent, *on the facts as developed in a trial,* then no patent, regardless of the merit of the invention, has value.

Dr. Chester Carlson, inventor of xerography, spoke to the incentive that patents provide when he was awarded the "Inventor of the Year" award in 1964. He stated:

> "The time scale of invention is a long one. Results do not come quickly. Inventive developments have to be measured in decades rather than years. It takes patience to stay with an idea through such a long period. In my case I am sure I would not have done so if it were not for the hope for eventual regard through the incentives offered by the Patent System". 47 J.P.O.S. 288 (1965)

In the present case, there is a good bit of irony which reflects, we suggest, the departure from the Constitutional intent that our patent system is experiencing. Here, the Bylund inventions succeeded in the Patent Office and in industry. They swept the industry free of all other approaches to aluminum beverage can manufacture, saving enormous quantities of energy and materials.

The magnitude of the Bylund advance in the art will be understood upon consideration that, as of 1976, the industry production of aluminum drawn and ironed

cans using the invention of petitioner's patents in suit was *20,900,000,000* cans or more than *50,000,000* (fifty million) cans per day (RMA 268-269). By this time we estimate that close to 100 billion more have been produced.

The Court of Appeals struck the patents down without even a passing consideration of the trial court's findings or the evidence on which they were based. The Court of Appeals simply found the facts that were to their liking, and we believe a manifest injustice resulted. We believe such injustices will spread if the Courts of Appeal do not adhere to the admonitions of the Supreme Court in respect to Federal Rule 52(a), or follow the instructions laid down by this Court for patent cases in the *Graham* case, 383 U.S. 1, 12-19.

CONCLUSION

The Bylund inventions have succeeded in the Patent Office and in industry. The Bylund inventions swept the industry free of all other metal tempers and methods and were copied by defendants. In spite of their availability under license, for a very nominal royalty, they were copied and appropriated by a company (Alcoa) that had, itself, secured its initial success as the Pittsburgh Reduction Co. by reason of its own patent on the early Hall invention on the reduction of aluminum. Charles C. Carr who was Director of Public Relations of Alcoa some years ago wrote in his book ALCOA--An American Enterprise, at page 60 (1952):

> "Hall is likewise indebted to the American patent system for protecting his right to his invention. Under the patent law, the Pittsburgh Reduction Company, the owner of the patent was given for a term of seventeen years, the 'exclusive right to make, use and vend the invention'. These were important rights, vital to the young business. The pioneers would never have ventured their $20,000 of capital for a pilot plant without the virtual certainty that the Hall patent, already applied for, would be issued in due course. The patent was granted, and the period until it expired gave the Pittsburgh Reduction Company a good opportunity to develop the process commercially and become established in the manufacture of aluminum."

Thus, from the Hall invention and the patent which protected it, came the largest aluminum company in the whole world—yet now a willful infringer of Bylund's patents—who, with National, "have chosen to follow the path found by Reynolds rather than another path or one they themselves forged by their own efforts." (60a). In this old Alcoa case the hope of protection by the Hall patent caused the investment of twenty thousand dollars, and from this came the building of the largest aluminum company in the world.

In the *Graham* case (383 U.S. 1) the Supreme Court instructed the federal courts how to deal with patent cases. If the sensible, thoughtful procedure there set forth is not complied with, and if the Court of Appeals just runs over the patent lightly and gets a subjective impression upon which to base an opinion, then we hardly need to have a district court, for what it has said after days of trial, as in this case, seems to have meant nothing, although the Supreme Court in its instructions of the *Graham* case *meant that it should mean a whole lot.* If invalidity is the popular answer to most all patent appeals, the Court of Appeals merely has to get on the bandwagon and join the parade. But that does not face the *danger* that the United States finds itself in today. *We need innovation. We need new production, we need*

new tools, we need to save energy and time in order to catch up with our competitors in the world.

After careful study of this case, we, as counsel, respectfully suggest that the Court here should consider what *harm is being done to the public and to the nation,* by this kind of treatment from the Court of Appeals, to an invention of immense importance which has revolutionized the production of aluminum cans, saved energy, saved aluminum and saved time. We have laws which were intended to stimulate invention and innovation. These are the Constitution, the patent laws and a large body of judicial precedent which, while requiring inventions to meet high standards, did operate to protect important inventions.

Things went well under these laws for many years, as patents were fairly upheld and the United States became the leader in the industrial world. Then we slowed down and *it has become easier for competitors to just copy what the innovator had done and bear the expenses of the lawsuit.* As Senator Bentsen pointed out, we are behind and that we have got to tool up our industry to even compete. Decisions such as the Court of Appeals here, encourage copying and imitation of innovation, see Levitt, Innovative Imitation, Harv. Bus. Rev. Sept.-Oct. (1966).

The Bylund inventions taught the industry to do it better, cheaper, faster, with no heat, less energy, and less metal. The Bylund inventions succeeded, patents were granted and they were upheld after an extensive trial and long consideration by the trial court.

Not only the petitioner, but the public and the United States in these critical days will be dealt another blow in its efforts to overcome the decline of production

and innovation in our country, if petitioner's earned Constitutional reward is arbitrarily taken from it.

Respectfully submitted,

REYNOLDS METALS COMPANY
Petitioner

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APPENDIX

IN THE
UNITED STATES COURT OF APPEALS
FOR THE SEVENTH CIRCUIT

Nos. 78-1909 and 78-1910

REYNOLDS METALS COMPANY, *Plaintiff-Appellee,*

v.

ALUMINUM COMPANY OF AMERICA, a corporation, and
NATIONAL CAN CORPORATION, a corporation,
Defendants-Appellants.

Appeals from the United States District Court for the
Northern District of Indiana, South Bend Division.
No. S-CV-74-172—Allen Sharp, *Judge.*

OPINION

ARGUED JANUARY 16, 1979—DECIDED NOVEMBER 13, 1979

Before SWYGERT and BAUER, *Circuit Judges,* and GRADY, *District Judge.*[1]

BAUER, *Circuit Judge.* In this civil action, the Reynolds Metals Company charged Alcoa and National Can with infringement of U.S. Patents 3,691,972 and 3,814,590. These patents—known as the "Bylund" patents—deal with the manufacture of twelve ounce aluminum cans for beer and soft drinks. The lower court awarded judgment to Reynolds, and Alcoa and National Can now appeal.

I

To understand fully the issues presented in this appeal, we must first define some key concepts in the manufacturing of aluminum cans. The process of fabricating aluminum sheet involves the casting of molten aluminum into an ingot, which is then squeezed between rollers to reduce the thickness of the metal. This rolling process is repeated as often as is necessary

[1] The Honorable John F. Grady of the United States District Court for the Northern District of Illinois is sitting by designation.

to achieve the desired thickness, and is commonly referred to as "working" the metal. If the rolling of the aluminum is done at a high temperature, it is known as "hot working," and if it is done at room temperature, it is known as "cold working." When the gauge of the aluminum is reduced by "cold working," the strength of the metal increases, and it is said to be "work-hardened." The strength of work-hardened aluminum can be reduced, however, by "annealing"—that is, by heating it to a temperature at or above the recrystallization temperature.

Alloys of aluminum are generally designated by four digit numbers which identify the principal alloying elements and permissible percentage ranges in the alloy. Two common alloys which were well-known (and commercially available) for years prior to the patent at issue are "3003" and "3004." The principal alloying elements in these two types are manganese (from 1.0 and 1.5%) and iron (up to 0.7%). 3004 also includes magnesium from 0.8 to 1.3%.

The temper of aluminum sheet is conventionally designated by letters and numbers which follow the alloy designation. Work-hardened aluminum is identified by the letter "H." The first digit following the letter indicates whether or not the metal has received any heat treatment: "1" indicates that the metal has been work-hardened only; "2" indicates that the metal has been work-hardened and partially annealed; and "3" indicates that the metal has been work hardened and fully annealed. The second digit designates the amount of work-hardening, with "8" representing "full hard," "4" representing "half hard," and so on. Accordingly, "3004-H18" is 3004 alloy which has been cold worked to full hard condition. It should also be noted that H-18 temper is defined only by a minimum specified strength—there is no maximum and thus no range. If the minimum strength is raised slightly, the temper is known as H-19, but it is necessary to roll metal through H-18 temper to reach H-19 temper.

Finally, the actual manufacture of containers from aluminum sheet involves two processes. The first—so-called "drawing"—transforms a flat sheet of aluminum into a three-dimensional shape without appreciable change in the thickness of the aluminum. The second—so-called "ironing"—forces the cup through a die in order to form a deeper container with a thinner sidewall.

II

The crucial issue in this appeal is whether the Bylund patents are invalid for lack of novelty under 35 U.S.C. §102.[2] In essence, the patents are asserted to cover the manufacture of beverage cans by drawing and ironing "highly cold worked" aluminum alloys, e.g. 3004-H19. The lower court identified two significant differences between the patents and the prior art:

(1) the elimination of annealing or stress relieving in making D&I aluminum cans; and

(2) selecting alloying elements of sufficient ductility and strength to cold roll and draw iron the aluminum sheet into a can body without thermal treatments.

Reynolds Metals Co. v. *Aluminum Co. of America,* 457 F.Supp. 482, 495 (N.D. Ind. 1978).

From our review of the evidence, however, we are persuaded that everything claimed by the Bylund patents were

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[2] 35 U.S.C. §102 provides in pertinent part:

A person shall be entitled to a patent unless—

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States. . . ."

fully disclosed in the prior art, particularly the work of the Metal Flo Corporation. The evidence shows that prior to the Bylund patent, Metal Flo had drawn and ironed aluminum cans without annealing from highly cold worked material, having selected alloying elements with sufficient ductility and strength to be cold rolled drawn and ironed into a can body without thermal treatment. In particular, Metal Flo sold several thousand containers (sonobuoy housings) which it had manufactured by drawing and ironing 3003-H19 aluminum alloy without annealing or thermal treatment. In addition, Metal Flo manufactured and delivered to Reynolds drawn and iron twelve ounce beer cans made from various Reynolds-supplied alloys, including 3004 in tempers up to H-18.

The district court disregarded the evidence of Metal Flo's work, apparently on the grounds that Metal Flo had never developed a commercial success in *beer* cans. The court thus characterized Metal Flo's work as "incomplete, experimental and abandoned." 457 F.Supp. at 482. The unrebutted evidence shows, however, that Metal Flo did indeed operate commercially as to products such as the sonobuoy housings. And while it is true, as Reynolds argues, that this commercial use of the process involved products other than beer cans, the process is nevertheless anticipatory, for the differences are in dimension only. As this court stated in *Popeil Bros., Inc.* v. *Shick Electric, Inc.*, 494 F.2d 162, 165 (7th Cir. 1975):

> The issue of anticipation by prior art is not determined by insubstantial distinctions between a purported invention and prior art. A purported invention is anticipated by prior art 'if the general aspects are the same and the difference in minor matters is only such as would suggest itself to one of ordinary skill in the art.'

In our view, the dimensional differences between Metal Flo's work and the Bylund patents would indeed suggest themselves to one of the ordinary skill in the art.

Finally, we note that we find no significance in Metal Flo's subsequent financial difficulties, its unconventional or

antiquated equipment, and its inability to achieve a high rate of production. All of these matters, it seems to us, are immaterial to the patent claims at issue in this case.

We must therefore conclude that the district court reversibly erred in failing to invalidate the Bylund patents for lack of novelty under 35 U.S.C. §102. The judgment of the district court is REVERSED.

A true Copy:

Teste:

Clerk of the United States
Court of Appeals for the
Seventh Circuit

United States District Court
Northern District of Indiana
South Bend Division

No. S 74-172

REYNOLDS METALS COMPANY, a Corporation, *Plaintiff*

v.

ALUMINUM COMPANY OF AMERICA a Corporation, *Defendant*

and

NATIONAL CAN CORPORATION, a Corporation, *Defendant*

FINDINGS OF FACT
CONCLUSIONS OF LAW
OPINION
JUDGMENT

I.

This Court has determined to include all of the above items in this one document in the interest of clearly stating in one place the factual conclusions and the legal reasons therefor in this protracted and hotly contested case.

This case was tried to the Court without a jury during fifteen trial days by most able and experienced counsel. The Court heard extended oral argument for one full day and has entertained and carefully considered briefs and proposed findings and conclusions.

This shall constitute the findings of fact and conclusions of law as required by Rule 52 of the Federal Rules of Civil Procedure.

Plaintiff Reynolds Metals Company (hereinafter "Reynolds") is a Corporation of the State of Delaware and is a resident of and has its principal place of business in Henrico County, Virginia, Henrico County, Richmond, Virginia, and is the owner and assignee of the United States Letters Patent No. 3,691,972 entitled "Aluminous Metal Articles and Method" which issued on September 19, 1972 in

the name of Linton D. Bylund (hereinafter the '972 Bylund patent) and United States Letters Patent No. 3,814,590 entitled "Aluminous Metals Articles and Aluminum Base Alloys" which issued on June 4, 1974 in the name of Linton D. Bylund (hereinafter the '590 Bylund patent).

Defendant, Aluminum Company of America (hereinafter "Alcoa"), is a corporation of the State of Pennsylvania and has a regular and established place of business at South Bend, Indiana, within this district.

Defendant, National Can Corporation (hereinafter "National"), is a corporation of the State of Delaware, and has a regular and established place of business at LaPorte, Indiana, also within this district.

This action arises under the patent laws of United States Title 35, United States Code, and including Sections 271 and 281 et seq.

Jurisdiction is conferred on this Court by Title 28 of United States Code, Section 1338 and is conceded by counsel for the parties.[1]

The acts complained of have been committed, *inter alia,* in the Northern District of Indiana and venue is proper under Title 28, United States Code, Section 1400(b).

The '972 Bylund patent relates to aluminum foil and other articles including drawn and ironed can bodies produced from aluminum base alloys containing up to 2.5% iron and which have a low work hardening rate above 75% reduction and/or which exhibit sufficient ductility at cold work levels to permit cold working to the extent of at least 90% without the necessity of annealing or stress relieving [PRM 2066].[2] The Bylund patent was based on an application Serial No. 889,790, filed in the United States Patent Office on July

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[1] See Section A. of the Pretrial Order filed on March 29, 1978.

[2] The designation "PRM" refers to Plaintiff's Trial Exhibit numbers.

9, 1970, which application was a division of application Serial No. 712,314, filed on January 16, 1968, now United States Patent No. 3,571,910, which application was a division of Serial No. 660,132 which was a continuation-in-part of a now abandoned application Serial No. 573,776, filed in the United States Patent Office on August 8, 1966 and which was in turn a continuation-in-part of a now abandoned application Serial No. 379,782, filed in the Patent Office on July 2, 1964.

The '590 Bylund patent was based on a United States patent application, Serial No. 234,780, filed in the United States Patent Office on March 15, 1972, which is a division of application, Serial No. 889,790, filed in the Patent Office on July 9, 1970, now United States Patent No. 3,691,972, which was a division of application Serial No. 712,314, filed in the United States Patent Office on January 16, 1968, now United States Patent No. 3,571,910, which was a division of United States patent application Serial No. 660,132, filed in the United States Patent Office on August 11, 1967, now Patent No. 3,397,044, which was a continuation-in-part of a now abandoned United States patent application Serial No. 379,782, filed in the United States Patent Office on July 2, 1964.

Defendants have answered the second amended complaint and have denied all allegations concerning the infringement of the patents in suit and have also denied the validity of and enforceability of the patents in suit.

Defendant Alcoa has counterclaimed under the patent laws for declaratory judgment of non-infringement, invalidity and non-enforceability, as to each of the patents in suit and has further alleged that Reynolds' assertion and utilization of the patents in suit are violations of the laws of the United States and are contrary to the public policy of the United States. Reynolds has denied these allegations.

Defendant National has counterclaimed under the patent laws that the patents in suit are invalid, not infringed, and have been misused and are unenforceable. Defendant National has also counterclaimed under the antitrust laws alleging that Reynolds has sought to monopolize trade and commerce on drawn and ironed cans and unpatented aluminum sheet, a stable article of commerce. Reynolds has denied these allegations.

The chronology of Bylund Inventions and patent applications filed in the United States Patent Office has been provided to the court in graphic form. The Court now adopts the same and incorporates same here as evidenced by the attached appendix A.

II.

The inventor of the patents in suit, Linton D. Bylund, is a metallurgist who has been working for Reynolds Metals since 1946. He testified and was cross-examined for three or more days at the trial. To the extent that it matters this Court finds Mr. Bylund to be highly credible. During long and vigorous cross-examination by most adroit counsel Mr. Bylund's credibility remained intact. Between 1946 and 1951, Bylund worked as a metallurgist for various Reynolds plants, and in 1951 was transferred to the Metallurgical Engineering Division in Richmond, Virginia [Tr. 468-470] This Division is a small department, never numbering more than five or six metallurgists, and serves in a corporate staff function.

In 1962, Mr. Bylund was spending the majority of his time working on metallurgical aspects of light gauge aluminum foil. The sales people at Reynolds had asked the Metallurgical Engineering Division to see what could be done by way of making a stronger "Reynolds Wrap", the household aluminum foil being made and sold by Reynolds. Bylund got the idea that an aluminum-iron type alloy might provide just such a stronger foil, and proceeded to have one made to try out the idea. [Tr. 475] The particular alloy he proposed was one called MD79. In experiments with this MD79 it was found that it did not result in any significant increase in the strength of the foil. However, Bylund noted

something very unusual and very interesting about this MD79 alloy. As it was rolled down to very light foil gauges, it was found that the MD79 did not work harden normally, and indeed had a zero work hardening rate at high cold work levels around 90% reduction. [Tr. 486]

By April of 1964 Mr. Bylund had discovered that this unusual behavior of the work hardening characteristics of MD79 could be exploited so as to result in more economical foil production. Specifically, he discovered that the MD79 could be rolled down to very thin foil gauge; without resorting to the conventional annealing heat treatments that had been used previously to periodically soften aluminum as it was being rolled. A patent application directed to the use of the MD79 for foil was filed in July, 1964 [PRM 2056]. This patent application contained drawings illustrating the unusual zero work hardening rate of the MD79 alloy. As Mr. Bylund testified, and as is apparent from his subsequent actions, his work in the foil area instilled in him a keen interest in the behavior of aluminum alloys at high cold work levels. [Tr. 509-513]

During 1964-1965, Bylund's department at Reynolds had also begun to get somewhat involved in the metallurgical problems that the Reynolds Can Division was having in manufacturing drawn and ironed cans. The Can Division was experiencing low efficiencies in that some of the aluminum alloy sheet received from the Reynolds' rolling mills ran very well in the draw and iron presses and some did not. Work was going forward to isolate and correct the variables in the aluminum sheet that led to the variable performance. Mr. Bylund, along with other members of the Metallurgical Engineering Division, was involved in this work to the extent of serving as liaison between the Reynolds Can Division and the rolling mills that were fabricating the aluminum sheet, and trying to bring in ideas that might help the situation. [Tr. 496-498] The aluminum alloy sheet being used by Reynolds for draw and iron cans at that time was 3004 in a temper known as H320. This temper designation means that the

aluminum sheet was subjected to two furnace heat treatments, an annealing furnace treatment during cold rolling and a stress relieving furnace treatment after cold rolling, in order to soften it, i.e., remove the work hardening that occurred during cold rolling. The material was thus of a low cold work level as used for drawing and ironing.

In talking to the people in the Can Division in early 1965, Bylund was continually urging that they investigate work hardening rates at high cold work levels in the draw and iron process. [Tr. 507-513; PRM 1086] Bylund was thus proposing this in writing to Ed Maeder of Reynolds' Can Division in March of 1965 as a way of helping produce drawn and ironed cans with lower cost practices if they could get rid of the heat treatments. Mr. Bylund testified that at that point in time Mr. Maeder and others in the Reynolds Can Division just did not seem interested in his concept. [Tr. 507-513]

In September of 1965, Reynolds appointed a new Director of Metallurgical Engineering, this being a Mr. John Larson. Mr. Larson came from a production background; in fact, he came from being plant manager of one of Reynolds' rolling mills. One of the primary assignments given Mr. Larson by Reynolds' top management was to do something about the problems the Can Division was having, so as to improve the general economic outlook of that division.

As regards Reynolds' can program, Mr. Larson had two concerns. One was improving the fabricating practices used to make the sheet from which the cans were drawn and ironed. so as to have more consistent and better qualities for the severe draw and iron operation. Secondly, Mr. Larson being a production man, and having a production man's concern with making a product and selling it at a profit, he was concerned about the basic economics of the can Reynolds was making and selling.

Reynolds did have on-going programs at that time aimed at a lighter weight can using very highly alloyed aluminum sheet. Such sheet gets its strength through alloying. It still was

the practice to give such sheet the heat treatment prior to the draw and iron operation. These high strength alloys were primarily programs of the Reynolds Research Division, known as MRD, which stands for Metallurgical Research Division.

While the entire Metallurgical Engineering Division under Mr. Larson's guidance was looking at and trying to help solve some of the problems of variability in the sheet material that was being used by Reynolds for drawing and ironing, Mr. Larson specifically assigned one of his own men, Mr. Bylund, to spend the major portion of his time looking into the whole draw and iron process and seeing what could be done about the economics. Mr. Larson secured the Can Division's approval for Mr. Bylund to have access to the draw and iron press at the Can Development Center (CDC).

Mr. Bylund's keen interest in the concept of using highly cold worked materials, which stemmed from his work in connection with rolling foil, prompted him to take some sheets of the MD79 foil alloy that he had evolved, and which had been fabricated without any of the conventionally mandated special furnace heat treatments to soften it, and to try drawing and ironing a can out of this highly cold worked material. [Tr. 517] To his surprise, this aluminum alloy sheet that had *not* received any of the special softening heat treatments formed into a very good looking can on a conventional draw and iron press of the type that Reynolds was using in its can plants. [Tr. 519-520].

This was highly significant—and Bylund knew it. He knew that this foil alloy did not have enough alloying elements in it, such as manganese, magnesium, etc., to make a draw and iron can of suitable commercial strength, even in its highly cold worked condition. He was astute enough, however, to realize that something surprising and very significant had occurred. He realized that "the door was open" to the possibility of using a higher alloyed aluminum sheet without giving the aluminum sheet the traditionally required

heating or softening treatments in the furnace prior to making a drawn and ironed can therefrom. [Tr. 520]. His concept was that aluminum alloy sheet which had a low work hardening rate could be rolled without any of the traditional intervening heat treatments during or following cold rolling to soften it and would still withstand the severe drawing and ironing in a conventional draw and iron press without any thermal treatments. The potential savings were truly enormous.

The first thing Mr. Bylund had to do was find out which types of aluminum alloys in a highly cold worked temper would act this way. Therefore, with Mr. Larson's blessing, he embarked on a program to develop this concept to a full commercial reality. Bylund's initial approach in this development work was to use aluminum alloys in highly cold worked condition for drawing and ironing into cans, with the aluminum alloys being selected on the basis of their known ability to be rolled down in cold rolling mills to over 90% cold worked condition for drawing and ironing into cans, with the aluminum alloys being selected on the basis of their known ability to be rolled down in cold rolling mills to over 90% cold working reduction without splitting or tearing apart. [PRM 2090; Tr. 521-523]. Thus in addition to the specially evolved foil alloy (known as MD79) from which the first drawn and ironed cans were made from highly cold worked material, Mr. Bylund's initial work, as shown in his report dated February 1, 1966, comprehended making cans from an alloy registered with the Aluminum Association under the number 1235, as well as a series of stronger registered alloys, such as 3003, 3005, and 3004. [PRM 2090].

In August of 1966, a second patent application was filed in Mr. Bylund's name, which was a continuation-in-part of the earlier 1964 application on MD79 foil. [PRM 2057]. It repeated the earlier disclosure and drawings of MD79 foil, and added new disclosure on a wider range of iron content for MD79 and that highly cold worked MD79 that had not received any of the conventional thermal softening treatments

could be drawn and ironed into cans, also without any intervening thermal treatments.

Meanwhile, Mr. Bylund's further work on his concept of using highly cold worked aluminum alloy sheet for drawing and ironing without any thermal treatments was going forward toward a commercial reality. During 1966 and 1967 this work entailed not only working with the iron-containing common aluminum alloys such as 3003, 3005 and 3004 that are registered with the Aluminum Association, but also creating and modifying alloys, all in an effort to find the best commercial form for utilization of the concept. One of the areas that Bylund was pursuing as far as creating new alloys was adding manganese and magnesium to an MD79 type alloy to strengthen it. Various versions of such an alloy, which was called MD112, were experimented with throughout 1966 and 1967 in addition to the common, registered alloys.

In May of 1966 and again in December of 1966, Mr. Bylund issued additional progress statements on his investigations of drawing and ironing cans from a variety of alloys in the highly cold worked H19 temper, some being high in iron, i.e., MD112, and others being registered alloys having somewhat lower iron limits, i.e., 3003, 3005, 1100. [PRM 2108, 2132].

At this time Mr. Bylund was still primarily interested in using a high iron content alloy in an H19 temper for draw and iron can stock. One reason for his preferring iron is that it is intrinsically a cheaper alloying element than is manganese or magnesium. Additionally, a high-iron content alloy would be beneficial from the standpoint of recycling aluminum. [Tr. 1346-1348]. In recycling aluminum, the recycled aluminum inevitably ends up containing a higher percentage of iron than it did before it was recycled. This is due to the unavoidable inclusion of some iron impurities in aluminum products gathered for recycling. If the aluminum was used for i.e. can stock in a high iron content alloy it will be more tolerant of the use of this recycled aluminum.

In keeping with the preference for a high-iron alloy, it was decided to try a production evaluation of the MD112 high iron alloy for drawing and ironing can bodies.

Bylund prevailed upon the Can Division of Reynolds to allow a commercial production evaluation run of drawn and ironed cans at Reynolds' White Bear Lake plant made from sheet in accordance with Bylund's work. The sheet had not received any anneals, stress reliefs or any other softening heat treatments. This commercial production evaluation run was carried out in February of 1967 and in excess of 130,000 can bodies were drawn and ironed from this material on commercial equipment, operating at commercial speeds. [PRM 2145]. These over 130,000 can bodies were later filled with Hamm's beer and performed satisfactorily. [PRM 2146]. At this point in time it was clear that Mr. Bylund's concept of utilizing aluminum alloy sheet that had not received any of the softening heat treatments during or after cold rolling was not only technically feasible from the standpoint of being able to do it in a laboratory but was also commercially feasible from the standpoint of running smoothly on conventional existing equipment at commercial speeds and efficiencies.

Mr. Bylund's experiments with drawing and ironing a variety of alloys in H19 temper were meanwhile continuing. It should be recalled that Bylund's February 1, 1966 report had suggested that future work include an evaluation of drawing and ironing can bodies from 3004-H19. On April 13, 1967, Mr. Bylund did successfully draw and iron cans from 3004-H19. Mr. Bylund had enough 3004-H19 to make 24 cans and cups, and some of the drawn and ironed can bodies were subjected to buckling tests. [PRM 2160]. The test results were very encouraging because they showed that the can bodies made from 3004-H19 were able to stand an internal pressure on the order of 130psi, as opposed to around 90psi for MD112-H19 or 3004-H320. This implies the possibility of being able to form drawn and ironed cans from 3004-H19 in a thinner gauge than had been previously utilized, which portended great economic savings in the form of being able to make a lighter draw and iron can.

In April of 1967, Mr. Bylund again discussed the program of alloy investigation for potential D and I base stocks with Mr. Larson of Reynolds Metals' Metallurgical Engineering Department and with Mr. Gidley, the Can Division metallurgist. They jointly agreed on the direction the program should take, as reflected in a report prepared by Mr. Gidley on April 19, 1967. [PRM 2160]. That report recommended that Reynolds Metals:

"1) Continue the MD-112 evaluations as originally planned, but accept this alloy as the lower limit.

2) Initiate a program to further evaluate 3004 in the H-19 temper. Determine whether or not this alloy represents the upper limit.

3) Select an intermediate alloy and evaluate its capabilities."

During the week of August 3-11, 1967, Reynolds Metals evaluated at its Equipment Center the various alloys under consideration for D and I stock, which included MD112-H19 and 3004-H19. The results of this evaluation are contained in a report written by Mr. Gidley on September 7, 1967 [PRM 2179]. Over 100,000 3004-H19 cans were made during this period and were later filled and seamed by bottlers.

By the end August, 1967, Mr. Bylund's MD112 type alloy and the 3004 type alloy were the only two alloy systems that were under active consideration by Reynolds' Can Division for commercial application of Mr. Bylund's concept. When aluminum sheet made in accordance with these alloy systems is drawn and iron into can bodies with the aluminum sheet not having received any anneals or thermal treatments so that it remains in a highly cold worked condition, drawn and ironed cans made from each of these alloy types perform satisfactorily. Both alloys contain enough alloying elements to provide adequate strength and both have enough iron to provide a die polishing effect on the draw and iron tooling.

Cans made from the MD112 type alloy systems are a little bit cheaper in that the basic alloy itself is a little bit

cheaper than 3004. On the other hand, cans made from the 3004 type alloy system provide a little more strength in the finished can than those made from MD112. [PRM 2197]. The Can Division of Reynolds opted in 1968 to produce cans commercially from a 3004 type alloy system in highly cold worked condition and to discontinue considering MD112 for commercial draw and iron considerations. A 3004 type H19 alloy is still used today by Reynolds.

In the midst of the first large scale production evaluations of 3004-H19 (and the third for the MD112-H19) that were taking place during early August, 1967, the third Bylund patent application was filed. This was application Serial No. 660,132 filed on August 11, 1967, which was filed as a continuation-in-part of the earlier second application which had been filed in August of 1966. This third application repeated the drawings and disclosure of the earlier applications relating to the unusual work hardening rate of the MD79 Aluminum-Iron alloy in foil applications, and also to the use of the MD79 alloy in highly cold worked conditions, for forming drawn and ironed can bodies without any anneals or thermal treatments. In addition, this third patent application contained a broad, additional disclosure and claims relating to the basic concept of Bylund of cold rolling any of a variety of aluminum alloys into sheet and then drawing and ironing the sheet into a can body with the cold rolling and drawing and ironing operations being performed without the intervention of a thermal treatment. Thus, the application provided [PRM 2058, page 15] that:

"In accordance with the invention, and in keeping with the foregoing considerations, it has been found that aluminous metal of various types may be subjected to a fabricating operation which involves the steps of:

(a) hot rolling the metal to a hot line gage suitable for single or multi-stand cold rolling, such as between about 0.100" and about 0.250";

(b) rolling the metal from hot line gage in one or more cold rolling passes into coilable sheet stock of a thickness on the order of 10-20% of the hot line gage;

(c) forming the cold rolled sheet into a finished article, such as by drawing and ironing to effect a further reduction of about 65% (the total cold working reduction from hot line gage being in excess of 90%);

(d) performing the cold rolling and forming operations without the use of a thermal treatment at any thickness of the metal below about 0.100", the metal being work-hardened in the course of such operations and still retaining sufficient ductility for finishing steps such as necking or flanging of can bodies."

Claims were also presented in this application to a method involving the above steps without any alloy limitations other than that they have a low work hardening rate in the region above 75% reduction and sufficient ductility at high cold work levels to permit cold working to the extent of at least 90% without the necessity of annealing or stress relieving the metal. These were presented as original Claims 30-39 [PRM 2058, pp. 28-31]. These claims are the ones that ultimately issued as Claims 1-10 of the '972 patent in suit with some minor amendments by way of thickness limitations and specifying forming a hollow article.

The 660,132 application also contained additional specific disclosure of and claims to the new MD112 type of alloy, containing not only iron but manganese and magnesium as well. Thus the specification provided [PRM 2058, p. 16]:

> "It has also been discovered that the beneficial effects of relatively high iron content in the essentially binary aluminum—iron alloys previously mentioned, particularly in reducing the work hardening rate, are applicable with respect to alloys containing additional alloying elements such as magnesium, manganese, or both.
>
> * * *
>
> In accordance with this alloy aspect of the present invention, typical alloy systems are. . . "

In addition, specific examples 11-17 were contained in the third patent application, these being examples of different MD112 type alloys of varying percentages of iron, magnesium

and manganese. These MD112 type alloys were specifically claimed in original claims 22-28, with the limits of their alloying constituents being there delineated.

The 660,132 application as filed contained claims directed to:

(1) Aluminum foil made from the various high iron content alloys [Claims 1-4]

(2) A wrought aluminum article made from the various high iron content alloys [Claims 5-12];

(3) A method of making wrought aluminous metal articles from the highly cold worked high iron content alloys without any annealing or thermal treatments [Claims 13-21; Claim 20 specifically relates to drawing and ironing can bodies]

(4) The novel high iron content alloys themselves [Claims 22-28]

(5) A drawn and ironed can body made from a highly cold worked aluminum alloy including iron [without specifying a percentage] as an alloying element [Claim 29]

(6) The method of making articles from any aluminum alloy including cold rolling the aluminum to a greater then 75% reduction and then conducting a forming operation including imparting additional cold working to the extent of at least 90%, all without any thermal treatments. [Claims 30-39; Claims 34-39 related specifically to drawing and ironing can bodies from highly cold worked aluminum sheet.]

When the Patent Officer Examiner considered the application Serial No. 660,132, he determined that there was more than one separate and distinct invention being claimed, and accordingly, as provided by Patent Office practice, he issued a requirement for restriction between Group I claims pertaining to wrought articles and alloys [Claims 1-12 and 22-29] and Group II claims pertaining to a method of making wrought articles [Claims 13-21 and 30-39].

As a result of the restriction requirement Claims 13-21 and 30-39 [the method claims] were cancelled from this application and were refiled in the dividional application Serial No. 712,314 on January 16, 1968 [PRM 2059]. The remaining claims in application Serial No. 660,132 were meanwhile allowed and issued in Patent No. 3,397,044 on August 13, 1968.

The divisional application Serial No. 712,314 thus contained all method claims, with the claims falling roughly into two groups. One group of claims (13-21) are directed to alloying aluminum including adding iron within a specified percentage range and cold rolling, with some of this group of claims specifying drawing and ironing. The other major group of claims (30-39) were not restricted to any particular kinds of alloys but rather related broadly to a method involving cold rolling aluminum sheet to specified reductions [with no annealing] and drawing and ironing can bodies therefrom. This application also was made subject to a requirement for restriction by the Patent Office. The broad method claims not restricted to any particular alloy were cancelled from this application and refiled in a further divisional application Serial No. 889,790 on July 9, 1970. The remaining claims in Serial No. 712,314, which pertained to specific high iron alloys, were allowed and issued as Patent No. 3,571,910 on March 23, 1971.

The divisional application Serial No. 889,790 [PRM 2060] was filed on July 9, 1970 with the non-elected method claims of the earlier application [along with five other new method claims[1] directed to the same invention]. A pre-examination amendment filed May 10, 1971 [PRM 2060, page 34] added seven article claims directed to a drawn and ironed can body made from an aluminum alloy containing 0.75-2.5% iron. Again, there was a further requirement between the broad method claims, unrestricted to any particular

[1] These claims issued as Claims 11-15 of the '972 patent and do not contain any alloy limitations.

alloy, and the article claims directed to drawn and ironed can bodies made from the particular novel alloys containing .75-2.5% iron. The Examiner full well appreciated that the broad method claims were not restricted to any of the particular novel high iron containing alloys which had been disclosed and claimed. In his requirement for restriction [PRM 2060, page 44] the Examiner noted that:

> "The method of fabricating recited in the Claims 1-15 could be used in making can bodies having a different composition than that claimed in Group II. For example the metal might contain 4% iron."

Thus, the Examiner was fully aware that the broad method claims were not restricted to using any of the specifically disclosed novel high iron content alloys.

In response to the requirement for restriction in application Serial No. 889,790 [PRM 2060], the article claims directed to a drawn and ironed can body made from an aluminum alloy were cancelled from this application and refiled in a further divisional application Serial No. 234,780 on March 15, 1972 [PRM 2061]. The broad method claims in Serial No. 889,790 were allowed and issued in Patent 3,691,972 on September 19, 1972. This is one of the patents in suit in this litigation.

The claims in the further divisional application Serial No. 234,780 to a drawn and ironed can body made from an aluminum alloy having particular alloying elements and being cold worked to specified degrees, were amended on August 22, 1973. Whereas the previous claims had specified the aluminum alloys of the drawn and ironed can body as having 0.75-2.5% iron and had characterized the alloy as exhibiting sufficient ductility to permit cold working to the extent of at least 90% without the necessity of annealing or stress relieving, the amended claims positively recited the wall of the drawn and ironed can body as being cold worked to the extent of at least 90% and characterized the aluminous alloy as containing "up to 2.5% iron in an amount sufficient to pre-

vent die pick-up from interfering with the drawing and ironing operations." The language "up to 2.5% iron" was not any new matter. That language appears in the Abstract of the Disclosure of the Application Serial No. 660,132 [PRM 2058, p.1], which was filed on August 11, 1967.

These amended claims were presented as claims of the type that issued as Claim 26 of Patent No. 3,397,044 [PRM 2058], issued August 13, 1968. That Claim 26 simply specifies the presence of iron as an alloying element, without specifying any particular percentages. Thus, Claim 26 in the 1968 '044 is broader than the claims presented in the August 22, 1973 amendment and which issued as Claims 1-6 of the '590 patent. This was pointed out to the Patent Office [PRM 2061, p. 30]. Method claims were also presented claiming the method of making the articles. With respect to the method claims (which issue as Claims 7-13 of '590 patent) Bylund's attorney explained as follows: [PRM 2061, p. 40-41]:

> "Thus, for example, the claims of 3,691,972 have no alloy limitations; and the claims of 3,571,910 are directed to methods involving essentially binary A1-Fe alloys (see claims 8 and 9 of that patent as to can making aspects). With respect to alloy aspects of the present invention, claims [1-13] are intended to be broad enough to cover making drawn and ironed can bodies from work hardened sheet of various standard aluminum base alloys including 3004, an alloy which has been widely used for cans, but previously either not for drawing and ironing, i.e. only for making seamed containers, or for drawing and ironing either in 0-temper or intermediate tempers of the type normally obtained by stress relieving the cold rolled sheet".

Because of the similarity, and to obviate a rejection on the basis of double patenting, a terminal disclaimer was entered in this application, disclaiming that portion of the term of the patent to issue which would have extended beyond the expiration date of Patent No. 3,397,044. This patent is also one of the patents in suit in this litigation.

In this trial evidence of ex parte tests which were made during its course was offered and admitted. Notwithstanding their receipt into evidence this Court takes a very dim view of same and does not here deem them as helpful or relevant. This view is apparently shared by others. See *Illinois Tool Works, Inc.* v. *Foster Grant Co.*, 547 F.2d 1300 (7th Cir. 1976), and *Popeil Brothers* v. *Schick Electric, Inc.*, 356 F. Supp. 240 (N.D. Ill. 1972).

III.

Under *Graham* v. *John Deere Co.*, 383 U.S. 1,17,15 L.Ed. 2d 545, 556 (1966), the following basic factual inquiries are to be resolved:

1. Scope and Content of Prior Art

The articles, patents and trade literature published at the time the inventions here were made all suggested going soft in conventional drawing and ironing. Additionally the activities of those in the trade all supported going to soft tempers. Alcoa activity published its claim to being the first to draw and iron H19 temper sheet without an intermediate anneal prior to this lawsuit.

2. Level of Ordinary Skill

Since the "level of ordinary skill" in a particular art has not usually been defined in writing, the usual way of determining such level is by referring to the subjective reaction of a person thoroughly familiar with the particular art and, if possible, one who practiced the art at the crucial time in question, *Malsbary Mfg. Co.* v. *Ald. Inc.*, 447 F.2d 809, 171 U.S.P.Q. 7 (7th Cir. 1971).

The persons of ordinary skill in drawing and ironing aluminum alloy sheet for beer and beverage cans at the time the Bylund inventions were made included persons from Reynolds, Alcoa and National, as well as from Kaiser, CCC, American Can Co., and Coors. Their background included

people actually making D&I aluminum cans; those in packaging development; and those in related managerial roles. There were also several people who possessed *more* than ordinary skill in the art as they held patents relating to the field. These would include Mr. Maeder and Mr. Sandor for Reynolds; and Mr. Close, Mr. O'Brien, Mr. Lake, Mr. Dunn, Dr. Anderson, and Mr. McBride for Alcoa.

Mr. Larson testified that the Reynolds' Can Division wanted softer alloys. Mr. Larson thought that flange annealing would allow high strength alloys in soft tempers to be used. He realized after learning of the Bylund inventions that the way to go was to use all of the strength from cold rolling—which was free—and then add just enough alloying elements for strength, without adding too much so that a can could not be formed. Mr. Maeder believed that H32 was the highest temper that the D&I process could tolerate. He was a patentee and a person of more than ordinary skill in the art. So was Mr. Sandor, who suggested using certain high strength alloys and stress relieving them. Mr. Gidley, Mr. Householder, Mr. Shockley, and Mr. Burleson all went along with H32 temper. All testified to the effect that they were surprised when they learned from Bylund that H19 tempers could be used.

At Alcoa, the plan was to use high strength alloys (PRM 2527) in "O" tempers (PRM 2533). When this decision was made Dr. Anderson, Mr. Blake, Mr. Schaffer and Mr. Wolff, among others, participated in, and Mr. O'Brien and Mr. Lake were informed of, the alloy selections. None of these persons suggested using H19 tempers. Mr. Lake, also a patentee, on May 12, 1967, had in fact informed CCC that the present specification for D&I cans was 3004-0 and that higher strength magnesium alloys were expected to be more attractive (PRM 2674), which would be 5056 and 5082 in "0" temper (PRM 2533). Dr. Anderson, Mr. O'Brien, and Mr. Lake all hold United States patents and are persons of more than ordinary skill in the art. The program went forward with the high strength "0" temper alloys (PRM 2533). Mr. Wolff,

was by June 27, 1967, to do the first phase of the project and make cups from the "0" temper alloys selected (PRM 2547). His work order is dated July 7, 1967 (PRM 2630). Actually, Alcoa was heavily into impacting as the best way to go (PRM 3187).

It was after Reynolds' order from Alcoa of 10,000 pounds of 3004-H19 for D and I in July of 1967, that Mr. O'Brien had the first sample prototype cans made at Alcoa from 3004-H19 (albeit with the aid of a torch). The record shows what the reaction was of the people of ordinary (and extraordinary) skills in the art of Alcoa.

Mr. Close, an inventor himself of aluminum can (PRM 2624), reported to Mr. O'Brien "Congratulations, I didn't think you could get there with the Drawn Iron process" (O'Brien Dep. Tr. 162). Mr. Close immediately shut down Alcoa's impact operations (PRM 2555) upon which Alcoa had spent millions of dollars (O'Brien Dep. Tr. 144). Mr. Dunn of Alcoa later claimed as an integral and important part of an invention of his in a patent application first filed in September of 1969 the use of H19 temper without heat treatments during drawing and ironing, and received patents (see PRM 2063 and 2064). Indeed, in prosecuting these Dunn patents the Patent Office was told that the prior art taught away from using H19 without heat treatments for drawing and ironing (PRM 2063 amendment of February 2, 1973). Mr. Sands, who confirmed the Reynolds Order for 3004-H19 D&I can stock (PRM 2831), regarded the use of H19 temper for D&I as a "major move" (PRM 2559 & 2560), one which enabled aluminum cans to leap-frog into a preferred position (Sands Dep. Tr. 85). Mr. O'Brien hailed it as the "first 'major step'", and recommended that Alcoa "immediately accelerate" the Alcoa development program (PRM 2550).

It is interesting to note that by August 10, 1967, even before Alcoa had made any of its prototype 3004-H19 cans, that Alcoa was pushing Coors to try H19 (PRM 2180). By August 25, 1967, Mr. Sands advised Mr. O'Brien in connec-

tion with O'Brien's August 17, 1967 letter reporting that prototype 3004-H19 cans had been made to "strike while the iron is hot" and produce 20,000 cans (PRM 2554), and by September 13, 1967, Mr. Sands needed two Alcoa cans filled with beer to "tip" CCC and American Can Co. (PRM 2555).

As seen from the above, those persons having a level of ordinary or above ordinary skill all had knowledge of aluminum drawn and ironed cans and included metallurgists (e.g., Gidley, Larson, Sandor, Householder, McBride & Peak), tooling and machinery persons (e.g., Maeder, Gidley, Dunn and unnamed persons at Coors and Kaiser), scientists (e.g., Dr. Anderson, Dr. Dedrick), aluminum sheet mill people (e.g., Larson, Nielsen) and aluminum packaging people (e.g., Sands, O'Brien, Lake, Gidley, Maeder). But only Mr. Bylund discovered that a D&I can could be made without intermediate anneals.

3. Differences Between The Prior Art and The Claims in Issue

There exists two principal and substantial differences between Mr. Bylund's inventions and the prior art:

(1) The elimination of annealing or stress relieving in the process of making drawn and ironed aluminum cans from the beginning of cold rolling through the ironing operation; and;

(2) The making of aluminum alloy sheet by selecting the amount of alloy elements to achieve sufficient ductility and strength to be able to cold roll and draw and iron same into a can body without thermal treatments.

The claims of the 3,691,972 patent (PRM 2066) are all concerned with the method of making can bodies (Claims 1-15) and the claims of the 3,814,590 patent (PRM 2067) here in issue, are all concerned with can bodies (Claims 1, 2, 5 & 6) and the methods of making the can bodies (Claims 7-13). The differences recited above are defined in these claims and are

disclosed the specification in columns 7 and 8 of the 3,691,972 patent (PRM 2066), and in columns 6, 7 and 8 of the 3,814,590 patent (PRM 2067).

4. The Nonobviousness of the Subject Matter As A Whole At The Time The Inventions Were Made Because of The Differences Between The Prior Art and The Subject Matter

The inventions in issue are nonobvious because Mr. Bylund went opposite to the direction the art was going at that time in two significant respects:

(1) The art was going to high strength alloys in "O" temper to gain strength, whereas Bylund was going to H19 temper sheet;

(2) The art was going to higher alloy content to achieve strength, whereas Bylund was going to temper to achieve strength with alloying content being whatever was necessary to make a satisfactory can.

History shows that the Bylund approach was correct and the prior art approach was not. The conclusion of nonobviousness is buttressed by the evidence relative to the secondary tests to be considered as set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, and repeated in *Trio Process Corp.* v. *L. Goldstein Sons, Inc.*, 461 F.2d 66 (3rd Cir. 1972), cert. den. 409 U.S. 997 (1972). These tests include the commercial success of the aluminum industry with draw and iron cans utilizing highly cold worked aluminum sheet without anneals or heat treatments, filling the long-felt and acutely-felt need of making a light weight aluminum can to compete with TFS cans, and the failure of others to develop the invention or solve the problem, although they had all the incentives in the world to do so. There is also the copying of the Bylund invention, coupled with defendants' public praise of and claiming credit for the invention, and Alcoa's filing of a patent ap-

plication claiming what Bylund had done as an integral and unobvious part of an Alcoa invention.

The list of advantages and secondary considerations of the Bylund inventions over the prior art includes:

(1) Aluminum D&I cans were made competitive with TFS in the industry;

(2) The draw and iron method swept the industry free of all other methods;

(3) H19 temper D&I sheet swept the industry free of all other tempers;

(4) The draw and iron aluminum can rose from nothing in the industry to capture over 50 percent of the market by 1976;

(5) Alcoa sales of H19 D&I stock rose from the 10,000 pounds ordered by Reynolds, which was the whole of Alcoa's 1967 sales, to 8 million pounds in 1970, to 235 million pounds in 1974;

(6) Alcoa's sales of "O" temper D&I stock fell from 21 million pounds to less than a million pounds over the period of 1970 to 1974;

(7) National's business in aluminum cans went from zero to 1967 to being the leading manufacturer by 1974;

(8) costly intermediate anneals were eliminated;

(9) only Bylund solved the problem of the struggle with TFS in the industry;

(10) only Bylund was able to satisfy the need in the industry for an aluminum can to compete with TFS;

(11) all of the industry failed to beat TFS with the impact method or with high strength alloys in "O" temper;

(12) the weight of the aluminum can was drastically reduced;

(13) costly intermediate handling of coils and storage was eliminated;

(14) unexpectedly, tool life was found to be better with H19 temper than with "O" temper sheet;

(15) Alcoa heralded use of H19 D&I stock as a major achievement;

(16) Alcoa filed and received a patent which emphasized that the use of H19 in drawing and ironing without any anneals or heat treatments was an unobvious invention;

(17) National lauded its can in its advertising as the "dynamic new can".

Courts have recognized an infringer's praise of the patented invention in its advertising as significant on the question of unobviousness. See, for example, *AMP Inc.* v. *Molex Prod. Co.*, 329 F. Supp. 1364, 1371, 170 U.S.P.Q. 2, 7 (N.D. Ill. 1971); *W.R. Grace & Co.* v. *Park Mfg. Co.*, 378 F. Supp. 976, 979, 181 U.S.P.Q. 490, 493 (E.D. Ill. 1974); and *Tracor, Inc.* v. *Hewlett-Packard Co.*, 182 U.S.P.Q. 340, 359 (N.D. Ill. 1974), affirmed 519 F.2d 1288 (7th Cir. 1975).

Not a single person having ordinary skill in the art testified at trial that the Bylund invention was obvious at the time it was made, see *National Dairy Prod. Corp.* v. *Borden Co.*, 394 F.2d 887, 890, 157 U.S.P.Q. 227, 229-230 (7th Cir. 1968). Mr. Nielsen candidly admitted at trial that the Bylund invention was something that people skilled in the art thought could not be done and that such people would have been impressed. The patents in suit satisfy all the statutory and case law indicia of significant and unobvious invention, and should be upheld. A recent comment by Judge William C. Conner is pointedly relevant:

> "When the evidence establishes that a number of persons skilled in the art, having access to all the necessary means and facilities, actually attempted over a substantial period of time to solve a problem and were unable to do so, I simply don't see how a court, merely on the basis of hindsight, can say that the solution was obvious to such persons at the very time they were searching vainly for it." *American Patent Law Association Bulletin*, October-November 1977, pp. 618-627

Defendants cite five instances of alleged prior knowledge by others and two alleged anticipatory publications as rendering the patents in suit invalid (DPT Br. p. 7-8). Under the applicable law these defenses are insufficient under 35 U.S.C. 102(a), (b), and 103.

Defendants have failed to show that the claimed *inventions* were *publicly* known by others before Bylund, as required under 35 U.S.C. 103(a), *Gayler* v. *Wilder,* 51 U.S. 477, 13 L.Ed. 504 (1850); *Soundscriber Corp.* v. *United States,* 360 F.2d 954 (Ct. Cl. 1966); *Connecticut Valley Enterprises, Inc.* v. *United States,* 348 F.2d 949 (Ct. Cl. 1965); *In re Borst,* 345 F.2d 851 (CCPA 1965). The evidence cited by defendants merely shows instances of non-public letters or memorandums or incomplete experimental can bodies of uncertain origin and material of Reynolds, Alcoa, or Metal Flo which fail to show the claimed *inventions* were in prior use by others, see *Illinois Tool Works, Inc.* v. *Continental Can Co.,* 397 F.2d 517, 519-520 (7th Cir. 1968); and *Illinois Tool Works, Inc.* v. *Solo Cup Co.,* 461 F.2d 265, 270 (7th Cir. 1972). These instances were experimental, incomplete and long forgotten and abandoned when defendants attempted to make a drawn and iron can (PRM 2533 & 2996). The evidence showed that Bylund acted independently and was without knowledge of these alleged instances when he made his inventions.

5. Prior Knowledge By Reynolds

As to Reynolds, defendants argue that in 1964 Reynolds had drawn and ironed cans, on production type tooling, from a 3004 type alloy that had been cold reduced up to 75 percent (DF 89), citing a single document (DA 2614). This is an internal private Reynolds document which expressly states an "*experimental*" 3004 "*type*" alloy was drawn and iron. It does not disclose Mr. Bylund's inventions of cold working in excess of 90 percent. The document concludes, "The problem of forming the flanges . . . .remains to be evaluated." No further work was done. This work was clearly incomplete and

also abandoned. Mr. Bylund testified that he did not know about it. (Tr. 897 & 898). Internal experimental work, incomplete on its face, which fails to disclose the invention, and which never went forward and concerning which no witness is called, is not prior knowledge which could anticipate the Bylund's inventions, *Illinois Tool Works, Inc.* v. *Continental Can Co.,* 397 F.2d 517, 519-520 (7th Cir. 1968). It added nothing to the useful arts and fails as a defense.

6. Prior Knowledge by Alcoa

Counsel for Alcoa disavowed any claim whatsoever at trial that someone at Alcoa invented the claimed subject matter prior to Bylund (see e.g., Tr. 48):

> [Alcoa Counsel]: This isn't a priority contest between Reynolds and Alcoa, your Honor, although they're trying to make it so, as much as Reynolds would like to make it so.
>
> THE COURT: It's not a race to the Patent Office?
>
> [Alcoa Counsel]: No. . .

Notwithstanding the above, the defense is without substance when examined on its merit. Alcoa's work was incomplete, experimental, using partially annealed temper sheet, which didn't meet the Bylund inventions, and which was "*dropped*" in favor of impact according to Alcoa's own employee (Quade Dep. T. 13-14) and *resurrected* solely for this law suit. Alcoa actually picked up discarded cups out of the scrap heap for this defense (Quade Dep. Tr. 94-95 and 99-100):

> "Q. I believe you indicated that the cups had been thrown out or scrapped and you got an inquiry from Alcoa counsel; is that right?
>
> A. Yes, sir.
>
> Q. And then you sent a technician out to pick them out of the scrap?
>
> A. Yes, sir." (Quade Dep. Tr. 99-100)

As stated in *Reynolds* v. *Whitin Mach. Works,* 167 F.2d 78, 83 (4th Cir. 1948):

> ". . .Patents for useful inventions ought not be invalidated and held for naught because of such excursions into the boneyard of failures and abandoned experiments."

7. Prior Knowledge by Metal Flo

This work was also incomplete, experimental and abandoned. (Gardner Dep. Tr. 123-124). The cans were not successful and were never filled and tested. Mr. Gardner testified that the Metal Flo process for beer cans was "not mechanically or technically sound, that approach, and the thing just kind of died a writhing, agonizing death" (Gardner Dep. Tr. 125). Further, the Metal Flo process is in the Massingill patent and was considered and rejected by the Patent Office (Grigorenko Dep. Tr. 78, 85).

8. Prior Knowledge from Metal Flo Meeting

Knowledge from the Metal Flo meeting rises no higher than item (3) above. Only about 45 minutes were spent with Metal Flo at the meeting (Brown Dep. Tr. 59-60) as it later learned that the Metal Flo process for beer cans was a "disaster" (Reynolds Dep. Tr. 38-39). Further, Mr. Maeder, in 1974, wrote that Reynolds was the first to draw and iron H19 temper sheet (PRM 2234). In any event, neither Bylund nor Palmer, his attorney, knew about Metal Flo (Tr. 681, 904 and 1086 and Palmer Dep. Tr. 178).

9. The Prior Art of D&I Cans from 3004-0 and 3004-H32

Defendants argue that "no conceptual problem" was involved in going from "0" to H32 temper and that therefore there would be "no conceptual problem" to go to H19 (DPT Br. 12).

This is hindsight reasoning by defendants, properly condemned by the Supreme Court in *Graham* v. *John Deere Co.,*

383 U.S. 1, 15 L.Ed.2d 545 (1966). The evidence overwhelmingly shows that conceptually the whole art, including the parties here, were hamstrung into thinking that softness was the way to go. Bylund alone went to super hard tempers.

More specifically, the Reynolds' Can Division itself thought you had to go soft. When metal didn't work they sent it back to McCook to anneal it (Tr. 137-39). After annealing, the metal worked, which taught the Reynolds Can Division to go soft. National, in early 1968, thought "0" temper was "ideal" (PRM 2996). Alcoa was taking H19 temper metal and annealing to "0" temper for Coors. When Alcoa began experimenting it went to high strength alloys in "0" temper PRM 2533). Earlier, Kaiser was in soft tempers. Truly there was a conceptual problem in going to harder tempers. Alcoa heralded H19 as a great advancement (PRM 2011) and filed for a patent on using H19 temper metal without any thermal treatment during drawing and ironing (PRM 2013).

Defendants also cite (DPT Br. 8) two patents as "anticipations", Massingill No. 3,509,752 and Sandor No. 3,345,159. Under the law of the Seventh Circuit, these references do not disclose all of the elements of the claimed inventions, see, e.g., *Illinois Tool Works, Inc.* v. *CCC, Inc.,* 397 F.2d 517, 518 (7th Cir. 1968).

10. The Massingill Patent

Massingill is an unconventional drawing operation involving telescopic punches, heat, vibrations, uninterrupted continuous movement of metal, and was rejected by the Patent Office. Everyone rejected it for cans. Alcoa had a copy of the application in 1964. It certainly did not teach Alcoa to stop annealing the coils it was supplying to Coors in 1966 and 1967.

11. The Sandor Patent

This patent, owned by Reynolds, relates to high strength alloys which are stress relieved, two significant differences compared to Bylund's inventions. The Sandor patent did not teach Reynolds to go to H19 temper material.

The documents, insofar as they are internal company memos which are not put into practice, are not anticipations, *Bolkcom* v. *Carborundum Co.* 523 F.2d 492, 499 (6th Cir. 1975), cert. den. 48 L. Ed. 2d 194 (1976). Both the work at ACC and at Metal Flo was considered confidential (PRM 2536 [ACC] and Gardner Dep. Tr. 95-96 [Metal Flo'). As stated in *Worthington* v. *Southern New Jersey Newspapers, Inc.*, 323 F. Supp. 443, 464 (D. N.J. 1970), "the knowledge relied upon must be accessible to the public." In *Worthington,* as here, reliance was placed on drawings and the like in company files and some experimental work not accessible to the public. Also, in *Worthington,* as here, reliance was placed on deposition testimony which failed to show exactly what was built, under what circumstances, and the accessibility to it.

Defendants have also alleged certain activities of Kaiser Aluminum as an anticipation of the Bylund patents (Findings DF94-100). They are not. Kaiser first became involved in drawing and ironing cans in the late 1950's, later abandoning all work as of about 1960. In fact, Mr. Reynolds testified that when Kaiser closed down its operations, Kaiser called Reynolds, indicating they were closing down and had some talented people [Reynolds Dep. Tr. 27]. Kaiser said "the men are going to be out on the street and if you are going to be in the can business, here's a good opportunity to hire them" [Reynolds Dep. Tr. 27]. Reynolds then hired Mr. Maeder and Mr. McAlpin [Reynolds Dep. Tr. 27].

Kaiser's commercial activites in drawn and ironed cans never amounted to very much. Their only production of drawn and ironed cans was using 3003 in the dead soft temper [Meyer Dep. Tr.42]. This only continued for

something less than a year [Henrickson Dep. Tr. 26-28]. There is some evidence that Kaiser made *drawn* cans in tempers up to H18, but the drawing operation in forming those cans did not involve any additional cold reduction [Meyer Dep. Tr. 41]. The material for the drawn cans, furthermore, was coated prior to forming, with the coating operation involving a heating operation. (Coating is an annealing operation which improves the formability of the sheet (PRM 2525, 2970, 2971). The drawn cans Kaiser furnished Mallory Air Force Base were formed from coated sheet [Henrickson Dep. Tr. 38-39].

Kaiser did, back in the late 1950's and up into 1960, have a desire to go to the use of higher tempers than "0" in the drawing and ironing cans, and conducted some experimental work. This experimental work involved a differential annealing operation on the can circles that were to be drawn and ironed. In this, the outer edges of the circular blank were heat treated to soften the metal that would end up being ironed to make the sidewall [Meyer Dep. Tr. 46; Henrickson Dep. Tr. 57; PRM 3166]. Thus the differential annealing work reflects the conventional thinking in the art that "softer is better".

Kaiser did a technical study during the first half of 1966 as to how it might be possible to make a lighter weight drawn and ironed can. The Kaiser conclusion was to use high strength, high magnesium alloys in the "0" temper, or at most H32 temper [PRM 3160]. Thus Kaiser's solution to making a light weight can was the very same wrong road chosen by Alcoa when it considered the question in 1966.

Kaiser did not find out the H19 material could be drawn and ironed into can bodies without any intermediate anneals until the fall of 1967 [PRM 3158]. This was after Reynolds' activities were made known to Kaiser through Coors. [PRM 3161].

Although Kaiser did not itself go back into the aluminum D and I can business until November, 1968 [PRM 3165;

Henrickson Dep. Tr. 32-33], Kaiser had been previously supplying D and I can sheet to others, including Coors. As of 1964 Kaiser's recommendations to National Can as to the best method of making beer cans was the use of 3004 in "0" temper or 3003 in "0" temper in a draw and iron operation [PRM 3164]. Even as late as January, 1969, Kaiser was using 3004-H32 for draw and iron, with work regarding H19 said to be in the experimental stage [PRM 3014]. It will be recalled that Mr. Maeder, who had worked for Kaiser in its initial draw and iron program, had been the one to choose H32 temper. Mr. Maeder had later indicted to Mr. Larson at Reynolds that H32 had been chosen because Mr. Maeder felt that was as hard as you could go [Tr. 129]. Later, after Bylund's work, Mr. Maeder, of course, found out differently, and freely wrote in 1974 that the breakthrough of drawing and ironing H19 metal without anneals or thermal treatments was a Reynolds' accomplishment [PRM 2234].

Defendants have also urged that "there is no significant difference between H18 and H19 for purposes of draw and iron fabrication". That is not correct. As Mr. Bylund testified, in making H18 at can stock gages you would have an anneal part way through the cold rolling [Tr. 707], which is not true for H19. Also, at the H18 gauge you're at a point where the metal structure has not yet changed into that which is characteristic of the high-cold work region above 75%. Above 75% reduction the metal structure is fragmented, and all these particles influence the behavior of the metal [Tr. 707]. There are thus significant differences between H18 and H19 for drawing and ironing. Further, Mr. Nielsen testified that in making aluminum sheet to can stock gage in H18 temper, you would cold roll part way, then anneal, and finish the cold rolling to 75% [Tr. 2061-2062]. This is an expensive process [PRM 2298]. Further, it would not be consistent with the *concept* of H19, which Mr. Nielsen indicated to be doing *all* the cold rolling from hot line gage to finish gage, without any anneals or thermal treatments [Tr. 1609-1610].

IV.

There has been much talk of fraud in this case. (Alcoa has taken a "softer" approach than National on this subject.) Patent cases including charges that a patent was procured through fraud are not new to this Circuit and as the Seventh Circuit noted in *Armour & Co.* v. *Wilson & Co.* 274 F.2d 143, 148 (7th Cir. 1960):

> "It is easy to make charges of fraud, but the law rightfully insists that before legal rights may be based upon such charges, they must be established by *clear and convincing evidence.*" (my emphasis)

See also *U.S.* v. *American Bell Telephone Co.*, 167 U.S. 224, 251 (1897); *Scott Paper Co.* v. *Ford Howard Paper Co.*, 432 F.2d 1198, 1204 (7th Cir. 1970), *cert. den.* 401 U.S. 913 (1971).

The burden of proving fraud by clear and convincing evidence is similarly the law of other circuits. *Carter-Wallace, Inc.* v. *Davis-Edwards Pharmacal Corp.*, 443 F.2d 867, 169 USPQ 625 (2d Cir. 1971); *Barr Rubber Products Co.* v. *Sun Rubber Co.*, 425 F.2d 1114, 165 USPQ 429 (2d Cir. 1970); *Xerox Corp.* v. *Dennison Mfg. Co.*, 322 F. Supp. 963, 168 USPQ 700 (S.D. N.Y. 1971); *In Re Multidistrict Litigation Involving Frost Patent*, 540 F.2d 601, 191 USPQ 241 (3d Cir. 1976); *Kearney & Trecker Corp.* v. *Cincinnati Milacron, Inc.*, 562 F.2d 365, 195 USPQ 402, 406 (6th Cir. 1977); *The National Rolled Thread Die Co.* v. *E. W. Ferry Screw Products, Inc.*, 541 F.2d 593, 192 USPQ 358, 363 (6th Cir. 1976); and *Pfizer, Inc.* v. *International Rectifier Corp.*, 538 F.2d 180, 190 USPQ 273, 278-279 (8th Cir. 1976).

The law clearly requires that the alleged fraudulent acts must have been carried out knowingly and willfully with an intent to deceive, that the information was not known to the patent examiner, and that the information concealed was material to the prosecution of the patent application, *Columbia Broadcast System, Inc.* v. *Zenith Radio Corp.*, 391 F. Supp. 780, 791 (N.D. Ill. E.D. 1975). Accord, *Pfizer* v. *IRC,*

supra; Parker v. *Motorola,* 524 F.2d 518, 535, (5th Cir. 1975).

Defendants argue, in effect, that there is an absolute duty to disclose matters that Mr. Bylund and his attorney, Mr. Palmer, were not even aware of because defendants argue these matters may be relevant. Such is not the law, as noted in *Pfizer* v. *IRC, supra,* at 186, because this would:

> "impose an unworkable standard of conduct upon the patent applicant and expands the inequitable conduct defense beyond legitimate limits."

Citing from Judge Mansfields's decision in *Xerox Corp.* v. *Dennison Mfg. Co.,* 322 F. Supp. 963, 968, (S.D. N.Y. 1971), the court in *Pfizer* saw there were good reasons for rejecting such a broad standard:

> "To deny enforcement as a matter of law merely because of an innocent or good faith non-disclosure would go beyond what is necessary to protect the public against the improvement granting of a monopoly. Such a standard could also have the harmful effect of forcing a patent solicitor to flood the Patent Office in each case with a mass of data of doubtful materiality rather than take the risk that an inventor might later be denied the fruits of his monopoly because of failure to reveal some fact later magnified out of proportion by an infringer seeking to escape the reach of the patent by combing the inventor's files under our liberal pretrail discovery procedures and dredging up new-found 'facts'."

This Circuit through Judge, now Mr. Justice, Stevens has determined that it is permissible to exercise one's judgment in the citation of art especially where there was an improbability the art in question would effect the Examiner's evaluation of the pending application, *CTS Corporation* v. *Piher International Corp.,* 527 F.2d 95, 99-100 (7th Cir. 1975). See also, *Wen Prod. Inc.* v. *Portable Elec. Tools, Inc.,* 367 F.2d 764, 767 (7th Cir. 1966), where it held that there was no unclean hands on the part of the patentee for a failure to disclose a prior art patent that did not embody the inventions defined

by the claims in suit. Accord, *Feed Service Corp.* v. *Kent Feeds, Inc.,* 528 F.2d 756, 762-763 (7th Cir. 1976).

The duty to disclose was considered in *Illinois Tool Works, Inc.* v. *Solo Cup Co.,* 179 USPQ 322, 370-371 (D.C. N.D. Ill. E.D. 1973) where the question involved inoperable, unacceptable prior articles. In reaching the conclusion there was no duty to disclose such items, even if knowledge of them was available, the court considered the items were not prior art since they were discarded as unacceptable.

There is also no duty to disclose to the Patent Office any prior use to which there is a bona fide basis for believing the use was experimental, *Clark Equip. Co.* v. *Keller,* 197 USPQ 83, 122 (D.N.D. 1976), aff'd 197 USPQ 209, 218 (8th Cir. 1978). Likewise, there is no duty to disclose to the Patent Office non-anticipatory prior art, *Scott Paper* v. *Fort Howard Paper,* 432 F.2d 1198, 1204, 1205, 167 USPQ 4, 9, 10 (7th Cir. 1970); *Duff-Norton Co.* v. *Ratcliff,* 362 F.2d 551, 553 150 USPQ 166 (9th Cir. 1966); *Clark Equip.* v. *Keller, supra.*

Defendants argue (DPT Br. p. 29) that the following "highly relevant" information was "known" to Reynolds and was not disclosed to the Patent Office:

(a) the internal MRD letter (DA 2614);

(b) the Metal Flo meeting (DA 228); and

(c) the Sandor patent (DA 2609).

Item (a) and (b) were not known to either Bylund or Palmer, his attornery (Tr. 681, 683, 897, 904, 1086 & 1321; Palmer Dep. Tr. 179, 181, 183 & 259). Item (c) was, of course, known to both but clearly not even considered relevant because it involved a thermal treatment of 380-385°F for 8 hours (DA 2609, Col. 2, lines 39-40). Further, the Sandor alloy, as Mr. Larson testified, was considered a failure (Tr. 223).

As stated in *Schnadig Corp.* v. *Gaines Mfg. Co.*, 494 F.2d 383, 393 (6th Cir. 1974):

> "The evaluation of prior art as it bears on the patentability of an invention is a matter of good faith judgment. As long as the patent applicant fulfills his 'uncompromising duty' of good faith and conducts the prosecution with utmost candor, making a frank and truthful disclosure, he is not required to 'list out the full spectrum of his knowledge to establish [his] bona fides.' *Eli Lilly & Co., Inc.* v. *Generix Drug Sales, Inc.*, 460 F.2d 1096, 1102-1103 (5th Cir. 1971)."

Here Mr. Palmer testified as follows (Palmer Dep. Tr. 258):

"BY MR. BLENKO:

Q. Mr. Palmer, returning to your activities while you were with Reynolds, did you recognize that in dealing with the Patent Office, an attorney has an uncompromising duty of candor and good faith toward the Patent Office?

A. Yes. Since that has become the accepted standard, yes.

Q. And you followed it at all times that you were with Reynolds?

A. I tried to."

As to Metal Flo, Mr. Palmer testified (Palmer Dep. Tr. 179, 181, 183 & 259):

"Q. Mr. Palmer, I am going to hand you the document that has just been marked as Exhibit DA-228-A and ask you whether you have ever seen that document before?

A. I don't recall that I have ever seen this before, no.

* * *

Q. Is it fair to say that your knowledge with respect to Metal Flo was limited to that which was set forth in the Massingill patent cited as a reference during the prosecution?

A. As far as I can recall, that is the case.

* * *

Q. Were you aware of any relationship of any kind between Reynolds Metals Company and Metal Flo Corporation in the period prior to August 8,1966?

A. I don't know whether I was aware of any or not. I don't recall any at the moment.

Q. You have no knowledge of any?

A. No.

* * *

Q. Do you recall any discussion or statement to you regarding a visit by Reynolds personnel to Metal Flo near Jackson, Michigan in August of 1965?

A. I believe the first time I became aware of that type of subject matter was after this suit was filed."

A marked up copy of the Massingill patent was found in Mr. McBride's files of Alcoa (PRM 2392). On this document (page 2) there appears the notation "0" temper tensile and yield strength greater than H19 value" (McBride Dep. Tr. 687), contrasting Example 4 involving "0" temper and Example 6 involving "H19" temper of Massingill. Thus, it is quite reasonable to conclude that Massingill does in fact involve some annealing when the "0" temper properties exceed those of "H19". Further, Alcoa's files contained a comparison of H19 draw and iron properties with those in Massingill. The difference in properties using H19 properties is truly striking: The D&I side wall was 45.3 ksi whereas the Massingill side wall was 30 ksi. In other words, the D&I H19 can had over 50 percent higher properties than the Massingill container (PRM 2024). This also suggests annealing.

All Mr. Palmer did was to suggest to the Patent Examiner that some anneal occurred. The Patent Examiner was free to, and did, evaluate the Massingill patent to his own satisfaction. Here, as in *Mueller Brass Co.* v. *Reading Ind., Inc.*, 352 F. Supp. 1357 (E.D. Pa. 1972), we have merely "an argument put forth for the evaluation of the expert examiner,

not a fraudulent statement of fact" and "the exhibits were there for the examiner's independent scrutiny" 352 F. Supp. at 1380.

Defendants have failed to show that Reynolds intended to deceive the Patent Office as to any information or that it purposefully withheld any material information from the Patent Office. The Patent Office did consider the Massingill patent which is the Metal Flo process. Under such circumstances, the presumption of validity over Massingill and the Metal Flo process is enhanced, *University of Illinois Foundation* v. *Block Drug Co.*, 241 F.2d 6, 112 USPQ 204 (7th Cir. 1957); and *Lewyt Corp.* v. *Health-Mor, Inc.*, 181 F.2d 855, 857 (7th Cir. 1950).

Defendants argue they are entitled to attorney fees based on their allegations of fraud. Defendants' failure to prove any fraud is also fatal to their argument for attorney fees. Under 35 U.S.C. 285, defendants must show that this case is "exceptional", that is, there is some wrong doing or fraud. As the Seventh Circuit Court recently stated in *H. K. Porter Co.* v. *Black & Decker Mfg. Co.*, 518 F.2d 1177, 1178, 1179 (7th Cir. 1975):

> "However, such attorney's fees are only awarded in our Circuit in exceptional cases 'to prevent gross injustice and where fraud and wrongdoing are clearly proved.' *Technograph Printed Circuits Ltd.* v. *Methode Electronics, Inc.* 484 F.2d 905, 909 (7th Cir. 1973)."

Accord, *Faulkner* v. *Baldwin Piano & Organ Co.*, 561 F.2d 677, 685 (7th Cir. 1977).

Further, defendants have not shown that Reynolds believed its patents invalid to support an award of attorney fees, see *Indiana Gen'l Corp.* v. *Krystinel Corp.*, 421 F.2d 1023 (2d Cir. 1970). To the contrary, the testimony shows that Reynolds believed its patents valid and that there were no inaccuracies in the representations made to the Patent Office (Reynolds Dep. Tr. 73 & Glenn Dep. Tr. 118), and still do. Mr. Reynolds testified (Reynolds Dep. Tr. 73):

> "Q. Why did you bring suit against Alcoa if you know?
>
> A. I suppose and I know that we think we have a valid patent and we have paid Alcoa for many patents that they have without a suit on anything. We think we have got a valid patent and that's why we brought suit.
>
> * * *
>
> A. As I recall we went to outside counsel as well as our own and everything, they came to me and said this, we think we have a valid patent and we should sue, and that is roughly all I can remember. . .

V.

Only National specifically pled an antitrust claim under Section 2 of the Sherman Act. Any claim under that section and *Walker Process Equip.* v. *Food Mach. Chem. Corp.*, 382 U.S. 172, 15 L. Ed 2d 247 (1965), must, include proof of:

1. A knowing, willful and intentional act of misrepresentation to the Patent Office, including omissions.
2. The misrepresentation must be material so that the patent would not have issued but for the misrepresentation.
3. The misrepresentation must be such that the Patent Office relied on it and this reliance must be reasonable and without error.
4. The patent holder must have practiced the fraud or attempted to enforce the patent monopoly.
5. The patent holder must be shown to have monopolized, or attempted to monopolize trade or commerce among the several states, 15 U.S.C. 2.

As stated in *Walker Process, supra:*

> "To establish monopolization or attempt to monopolize a part of trade or commerce under §2 of the Sherman Act, it would then be necessary to appraise the exclusionary power of the illegal patent claim in terms of the relevant market for the product involved. Without a definition of that market there is no way to measure Food Machinery's ability to lessen or destroy competition. It may be that the device—knee-action swing diffusers—use in sewage treatment systems does not comprise a relevant market. There may be effective substitutes for the device which do not infringe the patent. This is a matter of proof, as is the amount of damages suffered by Walker." 383 U.S. at 177-178)

National has failed to prove any of elements 1 to 4 above, as shown supra. The Patent Office independently considered the Massingill patent and the Metal Flo process. There was no obligation to disclose experimental work or failures, even if Bylund and Palmer knew of them. This result is just because such information would not bar a patent. The antitrust claim fails in its inception, see e.g., *Forbo Design Corp.* v. *Raytheon Co.*, 390 F. Supp. 794, 190 USPQ 70 (D. Mass. 1975), aff'd 532 F.2d 758 (1st Cir. 1976).

As for item 5, National has failed to show either the relevant market or the "exclusionary power" in the market required under *Walker.* As recently stated in *Tapeswitch Corp.* v. *Recora Co.*, 196 USPQ 348, 351 (N.D. Ill. 1977), the other elements of a Section 2 case include:

> ". . .The definition of the relevant market is a necessary element in the proof of a monopolization claim. *United States* v. *Grinnell Corp.*, 384 U.S. 563 (1966), as well as an attempted monopolization claim. *Tire Sales Corporation* v. *Cities Service Oil Company,* 410 F. Supp. 1222 (N.D. Ill. 1976). One aspect of the relevant market which must be made out is the product market. The classic definition of a product market is found in the case of *United States* v. *E. I. duPont de Nemours & Co.*, 351 U.S. 377 (1956). There the Court stated that

> 'In considering what is the relevant market for determining control of price and competition, no more definite rule can be declared than that commodities reasonably interchangeable by consumers for the same purposes make up that "'part of the trade or commerce,"' monopolization of which may be illegal.' 351 U.S. at 395.'"

Finding that *Recora* had failed to define the size of the relevant market or show plaintiff's share therein, the Court held that the Section 2 claim failed, as a matter of law.

The same situation exists in this suit. National has presented no evidence showing what constitutes the relevant market from the standpoint of the commodities or individuals involved. Nor has National shown the shares and shareholders in this undefined market.

Alcoa is admittedly the largest producer of H19 aluminum D&I can stock sheet and National is the largest producer of cans (PRM 2011B). National has not presented any evidence in this litigation that would even permit an appraisal of Reynolds ability to obtain some type of monopoly control in view of the dominance of the defendants. *Kearney & Trecker Corp.* v. *Giddings & Lewis, Inc.*, 452 F.2d 579, 598 (7th Cir. 1971). In *Kearney* the parties stipulated the relevant market, 452 F.2d at 597. National has also not presented any evidence of intent to exclude competition.

National alleges that it has no viable alternative but to infringe the patent. However, National also claims to employ only the Massingill approach and the Metal Flo process. Were that so, National has an alternative approach from that defined by the patents in suit. Reynolds makes no claim to the Metal Flo process using telescopic punches, vibrations, and retained heat. National, however, does not use that process.

However, the record shows that defendants copied the Reynolds inventions rather than pursuing a path of their own. Accordingly, it cannot be said that requesting a reasonable royalty for defendants' use of Reynolds' inventions is other

than lawful and reasonable. Further, as shown infra, Reynolds does not request an injunction against either National or Alcoa. Clearly, Reynolds has no intent to exclude lawful competition. Mr. Reynolds testified to just the opposite. (Reynolds Dept. Tr. p. 59). Likewise, in appraising the character of Reynolds' activity, it cannot be said to have been wrongful nor characterized as predatory.

There also is no evidence which establishes Reynolds' capacity to monopolize some yet undefined market, an intent to acquire the power to exclude competition from a significant share of that elusive market, nor the use of predatory means therefor.

Lastly, National has failed to show an injury. As stated in *Kearney* v. *Giddings, Inc.*, 452 F.2d at 599:

> ". . .to recover damages [defendant must also demonstrate that plaintiff's conduct injured (him) in his business or property. 15 U.S.C. §15"

National offered no evidence or testimony showing that their business or property has been injured in any way as a result of this litigation. In short, National has not met the burden of proof, which is upon them, as to any antitrust claim.

VI.

On the basis of the foregoing, the Court reaches the following conclusions:

1. In every patent case there is a presumption the patent in suit is valid. The burden of establishing invalidity rests on the defendant. 35 U.S.C.A. 282. *Helms Products* v. *Lake Shore Mfg. Co.*, 227 F.2d 677, 680 (7th Cir. 1955); *Copease Mfg. Co.* v. *American Photocopy Equipment Co.*, 298 F.2d 772, 777 (7th Cir. 1961).

2. When the prior art put forward by defendents has already been considered are rejected by the Patent Office, the presumption of patent validity is entitled to greater weight.

The burden of overcoming this presumption rests heavily on defendants and they have failed to provide a clear and cogent showing of invalidity. *Reese* v. *Elkhart Welding & Boiler Work, Inc.*, 447 F.2d 517, 526 (7th Cir 1971); *Illinois Tool Works, Inc.* v. *CCC. Inc.*, 397 F.2d 517, 519 (7th Cir. 1968).

3. The 1952 Patent Act, 35 U.S.C. §§1-293, sets out the conditions of patentability in three sections indicating that patentability is dependent upon three explicit conditions: novelty and utility as articulated and defined in section 101 and section 102, and non-obviousness, the statutory formulation as set out in section 103. *Graham* v. *John Deere Co.*, 383 U.S. 1, 12, 15 L. Ed. 2d 545, 86 S. Ct. (1966).

4. The claims of the '972 and '590 patents in suit are clear, understandable, unambiguous, and properly measure the inventions in suit within the requirements of 35 U.S.C. 112.

5. The evidence shows that notwithstanding the great need for a lightweight aluminum can and the effort expended toward that end, the facts show that others in the aluminum industry did not recognize that lighter weight hard aluminum sheet could be cold rolled and then drawn and ironed into can bodies without the need of any heat treatments. Accordingly, the presumption of validity of the patents in suit is strengthened by the unsuccessful efforts of others laboring in the same field. *Ekco Products Co.* v. *Chicago Metallic Mfg. Co.*, 321 F.2d 550, 554 (7th Cir. 1963).

6. The patents in suit were regularly and properly issued by the United States Patent Office, and the issuance of a patent is enough to show, until the contrary appears, that all conditions under which an invention is patentable, in accordance with the statutes, have been met. *Mumm* v. *Jacob E. Decker & Sons*, 301 U.S. 168 (1937).

7. Defendants have failed to discharge their burden of proof overcoming the presumption of validity of the patents. Defendants have not furnished the Court with evidence which would cause the patent to be held invalid under any statutory provision. Hence, the patents are valid and enforceable.

8. Prior discoveries that have not been fully understood or which unwittingly produced a result that was not sought will not serve to anticipate later inventions. *Tilghman* v. *Proctor et al,* 102 U.S. 711, 26 L. Ed. 279 (1881).

9. Alleged prior art which fails to achieve its intended result will not be considered an anticipation of a subsequently proven invention. *United States* v. *Adams*, 383 U.S. 39, 15 L. Ed. 2d 572 (1966). Likewise, an invention or discovery that is incomplete or not capable of producing the result sought to be accomplished, here the commercial production of lightweight, strong aluminum cans, that earlier invention cannot be availed of to defeat a patent founded on a complete and practical invention. *Coffin* v. *Ogden,* 85 U.S. (18 Wall) 120, 21 L. Ed. 821 (1874).

10. The Metal Flo process and cans made thereby are not an anticipation of the Bylund patents here in suit because that process has never been fully understood, was only an incomplete experiment that was later abandoned to the extent that it related to beverage can manufacture. *Coffin* v. *Ogden,* 85 U.S. 120, *supra; United States* v. *Adams,* 383 U.S. 39, *supra; Lyon* v. *Bausch & Lomb Optical Co.,* 224 F.2d 530, 534 (2d Cir. 1955), *cert den.* 350 U.S. 911, 100 L. Ed. 799, 76 S. Ct. 193 (1955); *Illinois Tool Works, Inc.* v. *Sweetheart Plastics, Inc.,* 436 F.2d 1180 (7th Cir. 1971); *Dart Industries, Inc.* v. *E. I. duPont de Nemours,* 348 F. Supp. 1338 (D.C. N.D. Ill. E.D. 1972); *W.R. Grace & Co.* v. *Park Mfg. Co. et al,* 378 F. Supp. 976 (D.C. Ill. E.D. 1974).

11. Under Section 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined. *Graham* v. *John Deere,* 383 U.S. 1, 17, 15 L. Ed. 2d, 545, 86 S. Ct. 684 (1966). See also *The Allen Group, Inc.* v. *Nu-Star, Inc.,* _____ F.2d _____, (No. 77-1840 7th Cir. April 28, 1978).

12. Since the "level of ordinary skill" in a particular art is not usually defined in writing, the usual way of determining that level is to refer to the subjective reaction of a person thoroughly familiar with the particular art and, if possible one who practiced the art at the crucial time in question. *Malsbary Mfg. Co.* v. *Ald, Inc.,* 447 F.2d 809, 171 U.S.P.Q. 7 (7th Cir. 1971).

13. It is clear from the facts that extensive efforts and many investigations were made in the early 60's to obtain a lightweight aluminum can. The aluminum industry had both the means and facilities at its disposal to solve that problem and the fact it was not sooner found and used lends credence to the conclusion the invention protected by the patents in suit was not obvious. *Carnegie Steel Co.* v. *Cambria Iron Co.,* 185 U.S. 403, 46 L. Ed. 968 (1902); *Pyle Nat. Co. et al* v. *Lewin,* 92 F.2d 628 (7th Cir. 1937); *National Dairy Products Corp.* v. *Borden Co.* 394 F.2d 887, 890 (7th Cir. 1968); *Schnell* v. *Albright-Nell Co.,* 348 F.2d 444 (7th Cir. 1965); *Shumaker* v. *Gem Mfg. Co.,* 311 F.2d 273 (7th Cir. 1962); *AMP Incorporated* v. *Vaco Products Co.,* 280 F.2d 518 (7th Cir. 1960).

14. When making the inquiries required by *Graham* v. *John Deere Co.,* 383 U.S. supra, the purpose of reconstructing the true circumstances existing at the time the invention was made must be kept in mind. Hindsight has no place and is of no value in this inquiry as to what would have been obvious at that time. *Diamond Rubber Co.* v. *Consolidated Rubber Tire Co.,* 220 U.S. 428, 435 (1911); *Walt Disney Productions* v. *Fred A. Niles Communications Center, Inc.,* 369 F.2d 230, 234 (7th Cir. 1966); *Zegers* v. *Zegers, Inc.,* 365 F.2d 156 (7th Cir. 1966); *Simplicity Mfg. Co.* v. *Quick Mfg. Inc.,* 355 F.2d 1012 (6th Cir. 1966); *AMP Incorportated* v. *Vaco Products Co.,* 280 F.2d 518 (7th Cir. 1960).

15. The fact that no one with ordinary skill in the art testified at trial that the inventions defined by the claims of the patents in suit were obvious at the time they were in-

vented buttresses the conclusion that this invention was not obvious. *National Dairy Products Corp.* v. *Borden Co.*, 394 F.2d 887, 890, 157 U.S.P.Q. 227, 229-230 (7th Cir. 1968).

16. Secondary considerations such as commercial success, long-felt but unsolved needs, failure of others, etc. may be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or non-obviousness, these inquiries may have relevance. *Graham* v. *John Deere,* 383 U.S. 1, 17, 18, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966).

17. The conclusion of non-obviousness is buttressed by the evidence relative to the secondary tests to be considered as set forth in *Graham* v. *John Deere Co.,* 383 U.S. 1, and repeated in *Trio Process Corp.* v. *L. Goldstein's Sons, Inc.,* 461 F.2d 66 (3rd Cir. 1972), *cert. den.* 409 U.S. 997 (1972). These tests include commercial success of the aluminum industry with draw and iron cans, filling a long-felt need of making a lightweight aluminum can to compete with tin free steel cans, *failure of others to develop the invention, including the defendants and copying by others also including the defendants.*See comments of Honorable William C. Conner, American Patent Law Association Bulletin, Oct-Nov. 1977, pp. 618-627. The fact that no one prior to Bylund had discovered the inventions defined by the patents in suit, in spite of a need is evidence of non-obviousness. *LaSalle Street Press* v. *McCormick & Henderson,* 445 F.2d 84, 93 (7th Cir. 1971).

18. The Massingill patent discloses even more than the Metal Flo experimental beverage can program, which was abandoned, and the latter program would have had no impact whatsoever on the issuance of the Bylund patents, since the Massingill patent was considered by the Patent Office which determined the Bylund patents were neither anticipated nor rendered obvious thereby. *Clark Equip. Co.* v. *Keller,* 570 F.2d 778, 197 U.S.P.Q. 209, 218 (8th Cir. 1978): *Tate Eng. Inc.* v. *United States,* 477 F.2d 1336, 1345, 175 U.S.P.Q. 115, 121-22 (Ct. Cl. 1973).

19. The facts show that work prior to the patents in suit did not practice the claimed inventions, even unwittingly and indicates the inventions here in suit were not obvious. *Tilghman* v. *Proctor,* 102 U.S. 707, 26 L. Ed. 279 (1881); *National Dairy Products Corp.* v. *Borden Company,* 394 F.2d 887, 890 (7th Cir. 1968).

20. Alcoa's statements in its advertising and in the Dunn patent application are of significant evidentiary value in determining the contemporaneous thinking of those skilled in the art and tend to confirm that the Bylund inventions defined in the claims of the patents in suit were not obvious. *Tracor, Inc.* v. *Hewlett-Packard Co.,* 519 F.2d 1288, 1307 (7th Cir. 1975).

21. To be patentable, a combination of elements must produce something more than the sum of the preexisting elements; there must be a synergistic result that is itself nonobvious. *Anderson's Black Rock, Inc.* v. *Pavement Salvage Co., Inc.,* 396 U.S. 57, 61, 163 U.S.P.Q. 673, 674-675 (1969); *Sakraida* v. *Ag Pro, Inc.,* 425 U.S. 273, 282, 189 U.S.P.Q. 449, 452, 453 (1976); *St. Regis Paper Co.* v. *Bemis Co.,* 549 F.2d 833 (7th Cir. 1977); *University of Illinois Foundation* v. *Block Drug Co.,* 241 F.2d 6 (7th Cir. 1957).

22. A novel combination of old elements which so cooperate as to produce a new and useful result of a substantial increase in efficiency is patentable. *Lewyt Corporation* v. *Health-Mor, Inc.,* 181 F.2d 855, 857, 85 U.S.P.Q. 335, 336-340 (7th Cir. 1950); *Helms Products* v. *Lake Shore Mfg. Co.,* supra at 681, 107 U.S.P.Q. at 315-316; *Weller Mfg. Co.* v. *Wen Products, Inc.,* 231 F.2d 795, 798, 109 U.S.P.Q. 73, 74-75 (7th Cir. 1956); *Mojonnier Dawson Co.* v. *United States Dairies Sales Corp.,* 251 F.2d 345, 116 U.S.P.Q. 106 (7th Cir. 1958); *Copease Mfg. Co.* v. *American Photocopy Equipment Co.,* 298 F.2d 772, 132 U.S.P.Q. 87 (7th Cir. 1961).

23. The inventions defined in the claims of the Bylund patents in suit produce a new and useful result, to-wit: the

ability to draw and iron can bodies from highly cold worked aluminum alloy sheet that has not been annealed or stress relieved without causing cracks in the metal during drawing and ironing together with increased tool life and are patentable. *Anderson's Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U.S. 57, 61, 163 U.S.P.Q. 673, 674-675 (1969); *Sakraida* v. *Ag Pro Inc.*, 425 U.S. 273, 282, 189 U.S.P.Q. 449, 453-453 (1976).

24. The inventions defined in the claims of Bylund patents in suit produce an unexpected result, to-wit: that the highly cold worked aluminum can stock material was easier to draw and iron than the soft material that had received heat treatments and, accordingly, comprise a patentable invention. *Trio Process Corporation* v. *L. Goldstein's Sons, Inc.*, 461 F.2d 66 (3d Cir. 1972); *Anderson's Black Rock, Inc.*, v. *Pavement Salvage Co.*, 396 U.S. 57, 163 U.S.P.Q. 673, 674-674 (1969); *Sakraida* v. *Ag Pro, Inc.*, 425 U.S. 273, 189 U.S.P.Q. 449, 452-453 (1976).

25. The claims of the patents in suit defined patentable, and unobvious inventions in that they accomplished a result which the prior art and defendants themselves said could not be done. *Trio Process Corporation* v. *L. Goldstein's Son's, Inc.*, 461 F.2d 66, 71 (3d Cir. 1972).

26. A person of ordinary skill in the art knowing of and being fully aware of the separate elements of the Bylund concepts, would not have expected that it would be possible to combine them and be able to draw and iron a practical lightweight aluminum can from highly cold worked aluminum sheet without any anneals or heat treatments from the beginning of cold rolling to the conclusion of drawing and ironing. *E.T. Industries, Inc.* v. *Whittaker Corp.*, 523 F.2d 636, 641 (7th Cir. 1975).

27. The inventions defined in the claims of the Bylund patents in suit produce a new, useful and unexpected result, to-wit: The ability to draw and iron can bodies from highly cold worked aluminum can stock without the necessity of

employing special anneals, heat treatments or stress relieving from cold rolling through the conclusion of the drawing and ironing process and are patentable. *Trio Process Corporation* v. *L. Goldstein's Sons, Inc.*, 461 F.2d 66, 71 (3d Cir. 1972); *Anderson's Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U.S. 57, 61, 163 U.S.P.Q. 673, 674-675 (1969); *Sakraida* v. *Ag Pro Inc.*, 425 U.S. 273, 282, 189 U.S.P.Q. 449, 452-453 (1976).

28. The "guiding star" in construction of a patent is the phraseology employed in the claims. *Super Products Corp.* v. *D.P. Way Corp.*, 546 F.2d 748, 756 (7th Cir, 1976); *Texas Co.* v. *Globe Oil & Refining Co.*, 225 F.2d 725, 729 (7th Cir. 1955). And it is the claims that measure the invention. *Laser Alignment, Inc.* v. *Woodruff & Sons*, 491 F.2d 866, 872 (7th Cir. 1974, *cert. den.* 419 U.S. 874 (1974); *Aro Manufacturing Co.* v. *Convertible Top Replacement Co.*, 365 U.S. 336, 339 (1961).

29. Claims 1-10 of the '972 patent were in all material respects present as claims in the August 11, 1967 patent application. Claims 1-10 are not limited to any particular aluminum alloy except ones that have a low work-hardening rate (or low work-hardening rate above 75 percent reduction) and sufficient ductility at high cold work levels to permit cold working to the extent of at least 90 percent without the necessity of annealing or stress relieving the metal. The evidence establishes that these criteria define a wide variety of alloys, including the 3004-H19 draw and iron can stock manufactured and sold by Alcoa.

30. The phrase "low work-hardening rate" or "low work-hardening rate above 75 percent reduction" is adequately disclosed by the patents in suit in Figure 3 and Examples 11-17 to refer to alloys having work-hardening rates identical to that of the 300-H19 draw and iron can stock manufactured and sold by Alcoa.

31. Claims 11-15 of the '972 patent are not limited to any particular aluminum alloy except those that have suffi-

cient ductility at high cold work levels to permit cold working to the extent of at least 90 percent without the necessity of annealing or stress relieving the metal. The evidence establishes that 3004-H19 draw and iron stock as manufactured and sold by Alcoa meets this criteria.

32. The claims of the '972 and '590 patents are not to be read as limited to the Al-high Fe examples nor the Al-high Fe Mg and/or Mn examples in the patent specifications. The specific examples in the patents set forth the best mode contemplated by Bylund for practicing his invention as of the filing date of August 11, 1967, in compliance with 35 U.S.C. 112. Section 112 only requires specific disclosure of the best mode, not all modes or embodiments of the invention, so that the claims, since they apply to all modes, are of necessity broader than the specific examples of the specification. *American Photocopy Equipment Co.* v. *Rovico, Inc.*, 257 F. Supp. 192 (N.D. Ill. 1966), aff'd 384 F.2d 813 (7th Cir. 1967). See also, *Eutectic Corp.* v. *Metco, Inc.*, 197 U.S.P.Q. 129 (2d Cir. 1978).

33. As applied to a patent, infringement is the unauthorized making, using or selling for use or for profit of an invention covered by a valid claim of a patent during the life of the patent. 35 U.S.C. §271.

34. The infringement of a patent may consist of any one, two or all three of the acts of making, using or selling the patented invention without the authority of the patent owner. *Schiff* v. *Hammond Clock Co.*, 69 F.2d 742 (7th Cir. 1934).

35. In determining whether an accused article or method infringes a valid patent, the accused article or method is to be compared to the language of the claims of the patent. If accused matter falls clearly within the claim, the claims are infringed. *Graver Tank Mfg. Co., Inc.* v. *Linde Air Products Co.*, 339 U.S. 605, 607 (1949). *CTS Corp.* v. *Piher International Corp.*, 527 F.2d 95, 100, 188 U.S.P.Q. 419, 423 (7th Cir. 1975), *cert. den.* 424 U.S. 978, 189 U.S.P.Q. 384 (1976); *S.S. Kresge Co.* v. *Davies*, 112 F.2d 708 (8th Cir. 1940).

36. Defendant National Can's production of drawn and ironed cans is in accordance with claims 1-15 of Bylund patent 3,691,972 and claims 1, 2, and 5-13 of Bylund patent 3,814,590 and has been and is still being done without the authority of Reynolds. This activity constitutes a direct infringement of the asserted claims of the patents in suit. *Reese* v. *Elkhart Welding and Boiler Works, Inc.*, 447 F.2d 517, 528 (7th Cir. 1971).

37. Whoever actively induces infringement of a patent shall be liable as an infringer. 35 U.S.C. 271(b). Alcoa has actively induced infringement of claims 1-15 of Bylund patent 3,691,972 and claims 1, 2 and 5-13 of Bylund patent 3,814,590 by purposefully causing, urging or encouraging others including National Can to infringe. *Honeywell, Inc.* v. *Metz Apparatewerke*, 509 F.2d 1137, 184 U.S.P.Q. 387 (7th Cir. 1975)

38. Alcoa's aid and assistance to its D&I stock customers in solving customer problems associated with drawing and ironing has encouraged direct infringement of the patents in suit and renders Alcoa liable as an infringer.

39. In assessing whether a product is a staple article of commerce, the quality, quantity and efficiency of the suggested alternate uses are to be considered. *United States Gypsum Co.* v. *National Gypsum Co.*, 440 F.2d 510 (7th Cir. 1971); *Rohm & Haas Co.* v. *Owens-Corning Fiberglas Corp.*, 196 U.S.P.Q. 726, 745 (N.D. Ala. 1977).

40. Alcoa's aluminum sheet can stock is made advertised and sold specifically and expressly as draw and iron can stock. Any diversions by Alcoa of its D&I can stock have occurred only occasionally, have included defective material, and the amounts have been insignificant in comparison with the quantities used for D&I purposes. Accordingly, Alcoa's D&I can stock is not a staple article or commodity of commerce suitable for substantial non-infringing uses within the meaning of 35 U.S.C. §271(c). *Arthur J. Schmitt Foundation* v. *Stockham Valves & Fittings, Inc.*, 292 F. Supp. 893, 906 (N.D. Ala. 1966), aff'd. 404 F.2d 13 (5th Cir. 1968), *cert. den.* 398 U.S. 965 (1970).

41. The alternate uses proposed by Alcoa for its D&I can stock are clearly less efficient than the end use for which it is particularly adapted, and proposed less efficient alternative uses are not sufficient to avoid liability as a contributing infringer under 35 U.S.C. §271(c). *Johnson & Johnson* v. *W. L. Gore & Assoc., Inc.,* 436 F. Supp. 704 (D. Del. 1977).

42. The lack of proof of a regular program of diversion at Alcoa for its H19 aluminum can sheet stock confirms there is only a mere possibility now of non-infringing uses. This is apparently an afterthought and does not fulfill Alcoa's burden of showing actual and substantial use and does not prevent Alcoa's liability as a contributory infringer. *Fromberg, Inc.* v. *Thornhill, et al.,* 315 F.2d 407 (5th Cir. 1963).

43. The nature and character of Alcoa's and National's acts of infringement have not been of the type asociated with an innocent, good faith or accidental infringer and lead to the conclusion that both Alcoa and National are willful, intentional and deliberate infringers with a disregard of Reynold's patent rights. *American Safety Table Co.* v. *Schreiber,* 415 F.2d 373 (2d Cir. 1969, *cert. den.* 396 U.S. 1038 (1970); *Milgo Electronic Corp.* v. *United Telecommunications, Inc.,* _____ F. Supp. _____ (D.C. Kan. 1978).

44. New matter is material of a substantive nature that has the effect of changing the invention. *Topliff* v. *Topliff,* 145 U.S. 156 (1892).

45. The claims of the '590 patent here in suit carry forward concepts disclosed and claimed in the August 11, 1967 application and since they are supported by the disclosure in the application they do not constitute the addition of new matter. *Pursche* v. *Atlas Scraper & Eng. Co.,* 300 F.2d 467, 476-477 (9th Cir. 1961), *cert. den.* 371 U.S. 911, 9 L. Ed 2d 170, 83 S. Ct. 251 (1962), *Rel-Reeves Inc.* v. *United States,* 534 F.2d 274, 280 (U.S. Ct. Cl. 1976). 35 U.S.C. §112, 120, 132.

46. The fact that the Patent Office accepted the amended claims presented during prosecution of the Bylund '972 and '590 patents with no objection as to "new matter" is entitled to an especially weighty presumption of correctness, *Technicon Instruments* v. *Coleman Instruments,* 385 F.2d 391, 393 (7th Cir. 1967).

47. The claims which issued in the '590 patent in suit are supported by the disclosure of the August 11, 1967 application and are similar to but more limited than Claim 29 filed in the August 11, 1967 patent application. There is no late claiming in the '590 patent. 35 U.S.C. §112, 120. *Illinois Tool Works, Inc.* v. *Continental Can Co.,* 397 F.2d 517 (7th Cir. 1968); *Technicon Instruments Corp.* v. *Coleman Instruments Corp.,* 385 F.2d 391 (7th Cir. 1967); *American Photocopy Equipment Co.* v. *Rovico, Inc.,* 384 F.2d 813 (7th Cir. 1967); *Aerosol Research Co.* v. *Scovill Mfg. Co.,* 334 F.2d 751 (7th Cir. 1964); *Helms Products, Inc.* v. *Lake Shore Mfg.,* 227 F.2d 677 (7th Cir. 1955); *American Anode, Inc.* v. *Lee-Tex Rubber Products Corp.,* 136 F.2d 581 (7th Cir. 1943).

48. New claims can be added to an application or in subsequently filed continuing applications where the new claims are supported by disclosure in the original application, 35 U.S.C. §112, 120; *Acme Highway Products Corp.* v. *D. S. Brown Co.,* 431 F.2d 1074 (6th Cir. 1970), *cert. den.* 401 U.S. 956 (1971); *Technicon Instruments Corp.* v. *Coleman Instruments Corp.,* 385 F.2d 391, 393-394 (7th Cir. 1967); *King-Seeley Thermos Co.* v. *Refrigerated Dispensers, Inc.,* 354 F.2d 533 (10th Cir. 1965); *Coats Loaders and Stackers, Inc.* v. *Henderson et al.,* 233 F.2d 915 (6th Cir. 1956); 109 U.S.P.Q. 332; *Penn Yan Boats, Inc.* v. *Sea Lark Boats, Inc.,* 359 F. Supp. 948 (S.D. Fla. 1972), aff'd 479 F.2d 1328 (5th Cir. 1973).

49. The subject matter of Claims 11-15 of the '972 patent was adequately disclosed in the August 11, 1967 patent application as filed, and there was no late claiming with respect to these claims. *Binks Mfg. Co.* v. *Ransburg Electro-*

Coating Corp., 281 F.2d 252 (7th Cir. 1960); *Coats Loaders and Stackers, Inc.* v. *Henderson*, 233 F.2d 915 (6th Cir. 1956).

50. A comparison of the Metal Flo process and the patents in suit shows there are significant differences existing supporting Reynold's position that the limited information possessed by Reynolds was neither anticipatory nor more relevant than other information before the Examiner thereby evidencing the lack of materiality and any deceptive intent. Failing such a showing there can be no finding of fraud. *Beckman Instruments, Inc.* v. *Chemtronics, Inc.*, 328 F. Supp. 1132 (D.C. W.D. Texas 1971).

51. Alcoa and National have not sustained their burden of proving Reynolds guilty of fraud or misconduct in their proceedings with the Patent Office during prosecution of the patents in suit. Such proof must be shown by clear, unequivocal and convincing evidence which is lacking in this case. *In re Multidistrict Litigation Involving Frost Patent*, 540 F.2d 601 (3d Cir. 1976), 191 U.S.P.Q. 241, *U.S.* v. *American Bell Telephone Co.*, 167 U.S. 224, 251, 42 L. E. 144 (1897); *Schnadig Corp.* v. *Gaines Mfg. Co.*, 494 F.2d 383 (6th Cir. 1974).

52. The alleged misconduct of Reynolds must be accompanied by some element of materiality regarding the asserted basis for the misconduct as well as willfulness or bad faith. The standard is not one of liability for innocent or even negligent omissions, or misstatements before the Patent Office. Defendants have not established any element of Reynolds' willfulness or bad faith by clear and convincing evidence, *Super Products Corp.* v. *D. P. Way Co.*, 546 F.2d 748, 758 (7th Cir. 1976).

53. The standard of proof necessary for a finding of fraud is not one of liability for innocent or even negligent omissions, non-disclosures, or misstatements before the Patent Office. Rather, the alleged fraudulent misconduct "must be accompanied by some element of willfulness or bad faith,

which must be established by clear, unequivocal and convincing evidence, *Super Prod. Co.* v. *D.P. Way Corp.*, 546 F.2d 748, 758, (7th Cir. 1976); *Airtex Corp.* v. *Shelley Radiant Ceiling Co.*, 536 F.2d 145, 155 (7th Cir. 1976); *Everest & Jennings, Inc.* v. *Colson Corp.*, 371 F.2d, 243 (7th Cir. 1967); *Pfizer, Inc.* v. *IRC*, 538 F.2d 180, 186 (8th Cir. 1976)

54. There is no duty to disclose to the Patent Office any prior use to which there is a bona fide basis for believing the use was experimental, *Clark Equip. Co.* v. *Keller*, 570 F.2d 778, 197 U.S.P.Q. 83, 122 (D.N.D. 1976), aff'd 197 U.S.P.Q. 209, 218 (8th Cir. 1978). Likewise there is no duty to disclose to the Patent Office non-anticipatory prior art, *Scott Paper* v. *Fort Howard Paper*, 432 F.2d 1198, 1204, 1205, 167 U.S.P.Q. 4, 9, 10 (7th Cir. 1970); *Duff-Norton* v. *Ratcliff*, 362 F.2d 551, 553, 150 U.S.P.Q. 166 (9th Cir. 1966); *Clark Equip. Co.* v. *Keller*, 570 F.2d 778, 197 U.S.P.Q. 83, 122 (D.N.D. 1976), aff'd 197 U.S.P.Q. 209, 218 (8th Cir. 1978).

55. A claim for attorney fees under 35 U.S.C. 285 based on fraud on the Patent Office requires "clear and definite proof" that there was some wrongdoing or fraud. Since that requisite proof is lacking in this case, the defendants' claim for attorney fees is denied. *Super Prod. Corp.* v. *D.P. Way Co.*, 546 F.2d 748, 758 (7th Cir. 1976); *H. K. Porter* v. *Black & Decker Mfg. Co.*, 518 F.2d 1177, 1178-1179 (7th Cir. 1975); *Technograph Printed Circuits, Ltd.* v. *Methode Electronics, Inc.*, 484 F.2d 905, 909 (7th Cir. 1973); *Sarkes Tarzian Inc.* v. *Philco Corp.*, 351 F.2d 557, 560 (7th Cir. 1965); *Armour & Co.* v. *Wilson & Co.*, 274 F.2d 143, 148 (7th Cir. 1960).

56. National has not shown that the Bylund patents were fraudulently obtained. Without such a showing the antitrust claim fails in its inception. Accordingly, as to National Can's §2 Sherman Act counterclaim finding is made in favor of the plaintiff thereon. *Forbo Design Corp.* v. *Raytheon Co.*, 390 F. Supp. 794 (D. Mass. 1975), aff'd 532 F.2d 758 (1st Cir. 1976).

57. An essential requirement to establish monopolization or an attempt to monopolize under §2 of the Sherman Act is the definition of the relevant market for the product involved. National has provided no evidence by which it is possible to appraise or define the relevant market, its size nor the shares and shareholders therein. National Can's failure to meet its burden of proof in this regard causes its §2 claim to fail as a matter of law. *Walker Process Equipment* v. *Food Machinery & Chemical Corp.*, 382 U.S. 172, 15 L. Ed. 2d 247 (1965); *Tapeswitch Corp.* v. *Recora Co.*, 196 U.S.P.Q. 348 (N.D. Ill. 1977).

58. An element essential in proving a valid §2 Sherman Act claim is a showing of the alleged wrongdoers' ability to obtain monopoly control of the relevant market. While National Can has presented no evidence that would allow an appraisal of Reynolds' ability to gain monopoly control of a yet undefined market, National's size as to the largest producer of cans is impressive and confirms that the basis for the §2 claim is deficient and must fail. *Kearney & Trecker Corp.* v. *Giddings & Lewis, Inc.*, 452 F.2d 579 (7th Cir. 1971).

59. The evidence and testimony shows that defendants have chosen to follow the path found by Reynolds rather than another path or one they themselves forged by their own efforts. The character of Reynolds' activity has not been wrongful nor predatory and National's §2 claim lacks, therefore, any showing of intent, by Reynolds, of excluding competition. *Kearney & Trecker Corp.* v. *Giddings & Lewis, Inc.*, 452 F.2d 579 (7th Cir. 1971).

60. A necessary element in recovery of damages under a §2 Sherman Act claim, the proponent thereof must demonstrate that the alleged monopolizer's conduct has injured him in his business or property. National has not met this burden of proof and has offered no evidence of injury resulting from this litigation. No basis exists for the recovery of any damages even if a violation of §2 of the Sherman Act were found. *Kearney & Treaker Corp.* v. *Giddings & Lewis, Inc.*, 452 F.2d 579 (7th Cir. 1971).

61. Plaintiff's United States patents in suit numbers 3,691,972 and 3,814,590 are valid within the meaning of Title 35 of the United States Code.

62. Plaintiff's United States patents in suit numbers 3,691,972 and 3,814,590 are enforceable within the meaning of Title 35 of the United States Code.

63. Plaintiff Reynolds is entitled to judgment, including damages to be assessed by the Court, from the date of the infringement in an amount no less than a reasonable royalty together with interest and costs as fixed by the Court, 35 U.S.C. 284.

VII. JUDGEMENT

Judgment is hereby rendered in favor of plaintiff Reynolds as to validity, infringement and enforceability of United States Patent Nos. 3,691,972 and 3,814,590, and against defendants Alcoa and National. Judgment is hereby rendered in favor of plaintiff Reynolds and against defendants Alcoa and National as to all of defendants' counterclaims respecting said patents here in suit.

IT IS HEREBY ORDERED AND ADJUDGED that plaintiff Reynolds Metals Company is the prevailing party as to all issues, and, more specifically United States Patent Nos. 3,691,972 and 3,814,590 are valid and that Claims 1-15 of United States Patent No. 3,691,972 and Claims 1, 2 and 5-13 of United States Patent No. 3,814,590 are infringed by both defendants and defendant Alcoa has also contributorily infringed and induced National to infringe said patents.

Plaintiff Reynolds also prevails on all counterclaims tried in this case by defendants, and the Court now finds for the plaintiff and against defendants on said counterclaims.

It is further ordered and adjudged that the plaintiff recover its costs as against both defendants.

Enter June 6, 1978.

ALLEN SHARP
Judge, United States District Court

March 2, 1965 - Bylund conception of using highly cold worked sheet for D&I cans

Jan. 1966 - Bylund makes first cans from MD79-H19

February, 1967 - Production evaluation run of 130,000 cans from MD112-H19

April 13, 1967 - Bylund makes first cans from 3004-H19

July 17, 1967 - Reynolds orders 10,000 pounds of 3004-H19 D&I can stock from Alcoa

CONTINUING WORK BY BYLUND MAKING CANS FROM A WIDE VARIETY OF ALLOYS IN H19

July 2, 1964
S.N. 379,782
Abandoned

Disclosure

Al-Fe Binary
(0.6 - 1.2% Fe)
for aluminum foil.

Disclosed unusual work hardening rate of Al-Fe for foil at 90% reduction (Fig. 1)

Disclosed that Al-Fe-Mg Alloy had work hardening rate similar to common alloys such as 1100 and 5005 (Fig. 3)

Claims

(1) Aluminum foil composed of Al-Fe alloy. (Cl. 1-2)

(2) Method of producing Al foil - Adding Fe to pure Al to produce aluminum alloy 0.6 - 1.2% Fe and finishing alloy by working including cold rolling. (Cl. 3)

August 8, 1966
S.N. 573,776
Abandoned

Disclosure

Broadens disclosure of S.N. 379,782 to include larger Fe range (0.6 - 2.5% Fe), discloses sheet as well as foil, preferred range 0.75 - 1.2% Fe. Adds examples 1-10 including D&I cans from Al-Fe binary same drawings.

Claims

(1) Aluminum Foil 0.6 - 2.5% Fe (Cl. 1-3)

(2) Article 0.6 - 2.5% Fe (Cl. 4-12)
Dependent claim to can body (Cl. 5)

(3) Method - Adding 0.6 - 2.5% Fe and finishing by cold rolling without annealing (Cl. 13-21)
Dependent claim - rolling to .02" and forming by drawing and ironing without thermal treatment. (Cl. 20 & 21)

Division Required

Group I (Cl. 1-12) Articles of Manufacture
Group II (Cl. 13-21) Method of producing articles

Elected Group I article claims which Examiner eventually indicated (at interview) were allowable and these allowed article claims were transferred to S.N. 660,132.

August 11, 1967
S.N. 660,132
Pat. No. 3,397,044
Issued Aug. 13, 1968

Disclosure

As in issued patents. Section added re Production of Can Bodies and the Like with broad disclosure that a variety of Alloys can be cold rolled and then D&I, all without any thermal treatments. Also added portions re Al-Fe-Mg and Al-Fe-Mn ternary alloys and Al-Fe-Mg-Mn quaternary alloys, including new examples 11-16.

Claims

(1) Aluminum Foil 0.6 - 2.5% Fe (Cl. 1-4)

(2) Aluminum Article 0.6 - 2.5% Fe (Cl. 5-12)

(3) Method - adding Fe to Al (0.6 - 2.5% Fe) and finishing by cold rolling without annealing or thermal treatments (Cl. 13-21)
Dependent claims directed to drawing and ironing to form can body (Cl. 20-21)

(4) Aluminum alloy 0.75 - 2.5% Fe, 0.1 - 2.5% Mg, up to 1.5% Mn, also other Al-Fe alloys (Cl. 22-28)

(5) D&I can body made from work hardened alloy including iron as alloying element (no percentage limitation (Cl. 29)

(6) Method of fabricating aluminous metal by cold rolling and forming without thermal treatment below 0.100"; also method of making aluminous metal can by cold rolling and then drawing and ironing (no alloy limitations) without thermal treatments. (Cl. 30-39)

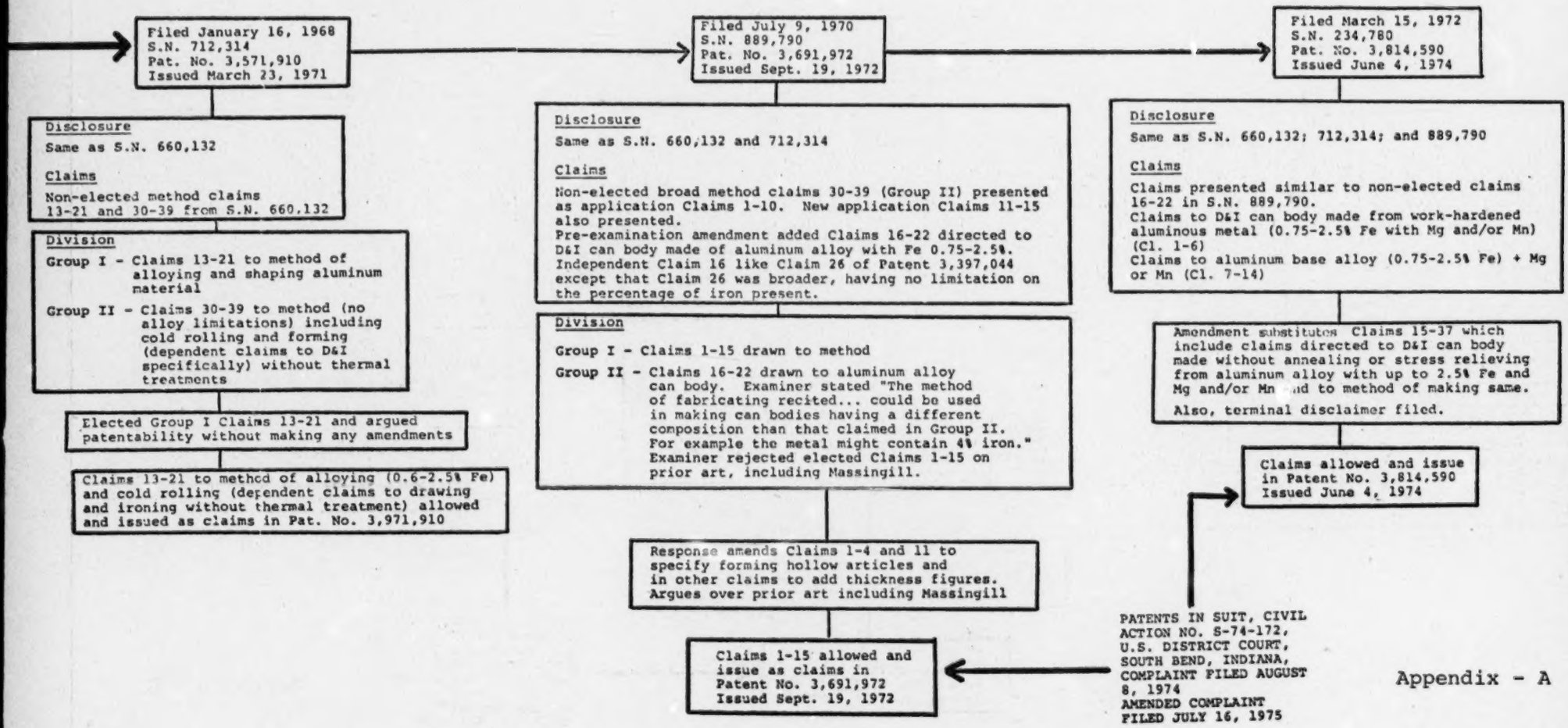
Division

Group I - Claims to wrought articles and alloys including allowed article claims from S.N. 573,776

Group II - Claims to method of making wrought articles (13-21 and 30-39)

Elected Group I - which were allowed and issued as claims in Patent 3,397,044

CHRONOLOGY OF BYLUND INVENTIONS & PATENT APPLICATIONS FILED IN UNITED STATES PATENT OFFICE



Appendix - A